IMPACT OF DISAGGREGATED GOVERNMENT INVESTMENT AND CONSUMPTION SPENDING ON ECONOMIC GROWTH IN SOUTH AFRICA

By

MARIBE MAMAFAKE HELLEN

Student no: 35952172

Submitted in accordance with the requirements for the degree of

Master of Commerce

in

ECONOMICS

at the

UNIVERSITY OF SOUTH AFRICA

Supervisor: Prof. Lydia Leshoro

ABSTRACT

This study was motivated by low rates of economic growth and insufficient investment in infrastructure to balance infrastructure backlogs and growth that the South African economy has been facing in recent years. The main objective of the study is to examine the impact of disaggregated government investment and consumption spending on economic growth in South Africa using the Auto-Regressive Distributed Lag (ARDL) technique and Error Correction Model (ECM). Annual time series data spanning the period 1983–2017 was employed. Earlier studies conducted in South Africa measured the impact of aggregated government expenditure on economic growth using different methodologies, including estimating procedures, model specifications and time frames. To the best of our knowledge, this paper is the first to study the effect of disaggregated government investment spending on the South African economy. This study, therefore, examines the disaggregated government spending on education, health, defence and social protection along with other control variables. The ARDL cointegration test result indicates the existence of a long-run relationship between the variables. The estimated ECM model reveals that the short-run impact of each explanatory variable is significant in explaining changes in economic growth in South Africa. These results will enable the spheres of government to formulate and adjust economic development policies that will produce the needed economic growth in line with the radical economic transformation programme in South Africa.

KEYWORDS: Government spending, investment, economic growth, ARDL, ECM.

DECLARATION

I Mamafake Hellen Maribe, hereby declare that this dissertation for fulfilment of Master of Commerce in Economics is my own work and that it has not been presented and submitted for any other degree award to any other university before.

Signature: ……

Date: ……

ACKNOWLEDGEMENTS

I wish to express my sincere gratitude to my supervisor Prof. Lydia Leshoro for her endless guidance and constructive advice through each stage of the process. Her patience in guiding and motivating me has contributed significantly to the success of this project.

Furthermore, I wish to extend my profound word of gratitude to my family for their meritorious support throughout the process. Lastly, I would like to give honour to God for the grace upon my life and for giving me the strength and ability to complete this project.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADF	Augmented Dickey Fuller
AIC	Akaike Information Criteria
ANC	African National Congress
ARDL	Auto-Regressive Distributed Lag
ASGISA	Accelerated and Shared Growth Initiative
CPI	Consumer Price Index
CUSUM	Cumulative Sum of Recursive residuals
CUSUMSQ	Cumulative Sum of Squares of Recursive residuals
ECM	Error Correction Model
ECT	Error Correction Term
EU	European Union
FFC	Fiscal and Financial Commission
FIFA	Fédération Internationale de Football Association
GDP	Gross Domestic Product
GEAR	Growth, Employment and Redistribution
GFCF	Gross Fixed Capital Formation
GFSM	Government Finance Statistics Manual
GVA	Gross Value Added
IPAP	Industrial Policy Action
MTEF	Medium Term Expenditure Framework
NDP	National Development Plan

NGP	New Growth Path
NHI	National Health Insurance
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PP	Phillips Perron
RDP	Reconstruction and Development Programme
SADF	South African Defence Force
SARB	South African Reserve Bank
SDG	Sustainable Development Goal
STATS SA	Statistics South Africa
VECM	Vector Error Correlation Model
UK	United Kingdom
UNICEF	United Nations Children's Fund
USA	United States of America
WHO	World Health Organisation

CHAPTER 1.

INTRODUCTION

1.1. Background to the study

Many studies (Biswal, et al. 1999; Bharat, et al. 2000; Christie, 2012; Chirwa & Odhiambo 2016; Leshoro, 2017, among others) have investigated the impact of government expenditure on economic growth. Among others, public sector economy concerns itself with how government expenditure increases. Although there is a wide range of economic theories, the impact of government expenditure on economic growth has been grounded on Wagner's law and Keynes's theory. However, Wagner's law and Keynes' theory present conflicting results when examined empirically by many studies: empirical work by Govindaraju et al. (2011), Ebaidalla, (2013) among others, corroborate Keynes's theory, others (Gupta, 1967 & Beck,1981) Wagner's law, and a few others validate both (Samundram et al. 2009, Katrakilidis & Tsaliki, 2009). Keynes's theory states that government expenditure enhances aggregate output and generates income. Keynesian economics are employed in this study to understand and prevent the recurrence of the 1930 Great Depression. No existing economic theories could unravel the Great Depression, and so the Keynesian economics were developed during the 1930s to understand the causes. Government expenditure played a limited role in public finance. Since the Keynesian revolution, government expenditure is now widely viewed as a very important tool in the growth and development of any economy worldwide (Keynes, 1936).

Adolph Wagner developed a "law of increasing state activity", which states that government economic ventures and responsibilities increase because of the economic growth. There is a cause-effect between government spending and economic growth (Wagner, 1877). Historically, the impact of government spending on economic growth has been debated extensively in economic literature. This impact with regard to economic growth continues to be paramount scrutiny between researchers, policy makers and economists around the world (Balaj and Lani, 2017). Studies have confirmed that an expansion in government spending has helped to mitigate the harsh effects of the global financial and economic crisis in South Africa. Kumo (2012) stated that economic infrastructure would contribute to economic growth and an increase in employment in South Africa in a long-run, whereas Gadinabokao and Daw (2013) proved that public capital does not stimulate economic growth.

Over the years, the financial framework has been promoting real growth in social expenditure, education, health, social grants, and community development in South Africa (National Treasury, 2018). Researchers have questioned whether increases in government expenditure contribute positively to economic growth or not. Some previous studies have examined the extent of the impact and found conflicting results attributable to methodological differences, estimating procedures, model

specifications, and time frames used. Wagner's law studied the expansion of government spending in health care, education, culture, and well-being in terms of the income elasticity of demand and revealed that income elasticity of health care, education, and culture is high; thus, economic growth will increase government spending for these services. Wagner argued that economic growth triggers an increase in government spending. Keynes, on the other hand, argued that government spending is an exogenous policy tool with a positive impact on gross domestic product (GDP). Therefore, government spending increases economic growth and a means to reduce short-term variations in total spending.

According to economic theory, government spending is the only solution to a stagnant economy in South Africa through expenditure outlays, which aimed to realise essential macroeconomic objectives in economic growth, poverty alleviation, employment, and price stability (Idenyi, et al., 2016). Most countries heavily rely on government spending for social security and infrastructure (National Treasury, 2018). An approach to measure national income using expenditure shows that government expenditure is still viewed as one of the main components of economic growth. Government expenditure is expressed by:

$$\mathbf{GDP = C + I + G + X - Z} \quad \ldots\ldots (1.1)$$

Where **C** = consumption expenditure by households, **I** = investment spending (capital formation by firms), **G** = government expenditure, **X** = expenditure on exports, and **Z** = expenditure on imports. Thus, increasing government expenditure can increase productivity and income (Mohr, 2015:49).

Government Finance Statistics Manual (GFSM), (2014) classified government spending in two ways: functional and economical. Functional government spending refers to a spending on social security and economic services. In economic classification, current and capital expenditure are distinguished. Current expenditure, for instance, includes interest, wage bill, subsidies, and transfers to households—mainly social pensions—and worldwide transfer payments, whereas capital expenditure comprises capital transfers to households, businesses, and the rest of the world; it also includes fixed capital assets and other intangible assets (GFSM, 2014).

1.2. Problem statement

South African economy was adversely affected by the growing international isolation between 1960 and 1990. As a result, it was virtually impossible to access technological developments and to participate in international markets because the country was barred from foreign educational and training institutions. This has resulted in low rates of economic growth, decreasing GDP per capita, high levels of unemployment, declining levels of savings and investment, and a stagnant employment in the formal sector (Fiscal and Financial Commission (FFC), 1998). The country further encountered

challenges such as insufficient investment in infrastructure and financial constraints to balance infrastructure backlogs and growth. Such challenges compromised the level of services and increased costs required to preserve the infrastructure (National Treasury, 2011).

The post-apartheid government inherited poor infrastructure in 1994. As a result, intensive efforts were made to address the infrastructure disparities and to improve access to social and economic infrastructure by providing housing, schools, health care, social grants, electricity, and clean water. To achieve this, the government introduced strategies and plans such as Reconstruction and Development Programme (RDP) in 1994 aiming to redress the social, economic, and spatial disparities of the previous administration.

To stimulate economic growth, the Growth, Employment, and Redistribution (GEAR) programme was established in 1996, as one of the main instruments for the realisation of the policy objectives contained in the RDP. Subsequently, the accelerated and shared growth initiative for South Africa (AsgiSA) framework was introduced in 2006 but was later replaced with the Industrial Policy Action Plan (IPAP) in 2007 and the New Growth Path (NGP) in 2010. In 2012, the government introduced the National Development Plan (NDP) 2030 as its roadmap toward a long-term socio-economic development. These programmes are intended to rectify inadequate and inefficient infrastructure, alleviate poverty and inequality, reduce unemployment, increase the country's infrastructure network, and improve economic growth. However, these challenges still prevail (FFC, 2006-2007, National Treasury, 1998).

Many studies could not reach a unanimous conclusion about the relationship between government spending and economic growth, theoretically or empirically. Some studies such as those by Landau (1983, 1986), Kormendi and Meguire (1985), Grier and Tullock (1989), Barro (1990, 1991), and Romer (1990) provide a negative view or there is lack of consensus on the effect of government expenditure on economic growth, However, others such as those conducted by Ram (1986), Grossman (1988), and Aschauer (1989, 1990) report positively about the effects. Earlier studies by (Mosikari and Matlwa, 2014, Molefe, 2017, Oladele, Mah, and Mongale, Molefe and Choga, 2017, and Leshoro, 2017) conducted in South Africa, could not reach a unanimous conclusion about the impact of either the aggregated or disaggregated government expenditure on economic growth. A major contributory factor to these conflicting results is due to differences in methodological procedures, model specifications, and time frames.

This study has taken into consideration these mixed reports. The approach seeks to validate or dispute the Keynesian theory in relation to government spending in South Africa. The study further seeks to close the knowledge gap by using robust and reliable test methods. Thus, the study is the first to observe

disaggregated government investment and consumption spending components and to examine their effects on the South African economy.

1.3. Importance of this study

The impact of government spending on economic growth, trends and direction of its increase are issues that are essential to the understanding of public sector economy. This study was motivated by the increasing level of government spending, low rates of economic growth and insufficient investment in infrastructure to balance infrastructure backlogs and growth that the South African economy has been facing in recent years. The study aims to provide an up to date empirical analysis on the impact of disaggregated government investment and consumption spending on economic growth in South Africa over the period of 1983–2017. The study also disaggregates each component of government spending (education, health, defence, and social protection) and examines their impacts on economic growth in South Africa.

The South African government spent most of funds on to health, education, defence, and social protection, and so it was easy to choose the variables of interest (Medium Term Expenditure Framework (MTEF, 2018). Barro (1991) categorised education, health, and defence into productive spending. Government spending on education is investing in human capital, whereas spending on defence supports the protection of property rights, which raises the likelihood of receiving the marginal product of capital. The government prioritises spending on upgrading health systems and hospitals (Barro, 1991).

The result of the study will enable the spheres of government to formulate and adjust economic development policies that will produce the needed economic growth in line with the radical economic transformation programme in South Africa. Because the study used both econometric techniques and descriptive analysis to examine the impact of disaggregated government investment and consumption spending components on economic growth in South Africa, its results will be of great benefit.

1.4. Research questions

Does each component of the disaggregated government investment and consumption spending have impact on economic growth in South Africa?

1. Does each component of the disaggregated government investment and consumption spending have impact on economic growth in the long- and short-run in South Africa?
2. Does Keynes theory of a positive correlation between disaggregated government investment and consumption spending and economic growth apply in South Africa?

1.5. Research objectives

The main objective of the study is to examine the impact of disaggregated government investment and consumption spending on economic growth in South Africa for the period of 1983–2017. The specific research objectives are as follows:

1. To empirically examine the impact of each component of the disaggregated government investment and consumption spending on economic growth in both the long- and short-run.
2. To test the applicability of Keynes theory, thereby determining whether there is a positive correlation between disaggregated government investment spending and consumption on economic growth and economic growth.

1.6. Research hypotheses

Null hypotheses:

H_{01}: Disaggregated government investment spending on education does not have a significant positive impact on economic growth.

H_{02}: Disaggregated government investment spending on health does not have a significant positive impact on economic growth.

H_{03}: Disaggregated government consumption spending on defence does not have a significant positive impact on economic growth.

H_{04}: Disaggregated government consumption spending on social protection does not have a significant positive impact on economic growth.

Alternative hypotheses:

H_{a1}: Disaggregated government investment spending on education has a significant positive impact on economic growth in South Africa.

H_{a2}: Disaggregated government investment spending on health has a significant positive impact on economic growth in South Africa.

H_{a3}: Disaggregated government consumption spending on defence has a significant positive impact on economic growth in South Africa.

H_{a4}: Disaggregated government consumption spending on social protection has a significant positive impact on economic growth in South Africa.

1.7. Scope and limitations of the study

This study mainly focuses on the impact of further disaggregated government investment and consumption spending components along with control variables on economic growth in South Africa.

That said, private sector investment expenditures is beyond the scope of the study due to the time constraint. While economic growth can be affected by both monetary and fiscal policies, this study focuses only on fiscal policy.

1.8. The structure of the study

The study is organised in six chapters. Chapter one introduces the study background, objectives, and limitations. Chapter two provides a brief overview, trends in government spending, and spending plans in South Africa. Chapter three reviews the theoretical views on government spending and economic growth as well as related literature on the impact of government investment and consumption spending on economic growth. Chapter four focuses on the research methodology. Chapter five provides a detailed analysis and interpretation of results and chapter six summarises the results, recommends, and concludes.

CHAPTER 2.

OVERVIEW OF GOVERNMENT SPENDING AND ECONOMIC GROWTH IN SOUTH AFRICA

2.1. Introduction

The end of apartheid and advent of democratic governance in the 1990s led to an increase in the government expenditure because the new Nelson Mandela-driven administration strived to deliver expedited social services for the black population after a lengthy hardship and neglect. In 1994, the government identified economic transformation policies that reinstated and sustained macroeconomic stability in a difficult global environment. Fiscal policy as one of South Africa's economic policies aimed to stimulate productivity and the economy by pursuing a policy stance that ensures a sense of balance between taxation, expenditure and borrowing that is consistent with sustainable growth (Ocran, 2011). Government expenditure was therefore deemed one of the main fiscal instruments used to attain macroeconomic goals. Economic growth improved significantly after the elections and the real GDP increased from 2.7 percent in 1994 to 3.4 percent in 1997 (South African Reserve Bank (SARB), 2006).

Total consolidated general government expenditure rose by 7.1 percent in fiscal year 1999/2000 compared with a moderate rise of 5.7 percent in 1998/99. During early 2000s, the government primarily focused on infrastructure spending on education, health, and community services such as connecting informal settlements to electricity and water networks. In 2005, the economic growth of the country was constrained due to a low rate of investment and a lack of infrastructural services (AsgiSA, 2007).

Many countries, including South Africa, experienced the global financial and economic crisis during 2008/2009. South Africa has since struggled to stimulate economic growth; the growth rate dropped to less than one percent per annum, while unemployment remained high at more than 26.0 percent in 2008. The government addressed this global financial and economic meltdown by spending more on socio-economic programs to increase the quality of health care and education and to alleviate unemployment.

In fiscal year 2009/10, total consolidated general government spending relative to GDP was 38.2 percent compared with 36.4 percent reported in the 2008/09 fiscal year. Expenditure growth of the 2010 Fédération Internationale de Football Association (FIFA) World Cup was mainly supported by infrastructure-related expenditure at the municipal level. After the 2010 FIFA World Cup infrastructure projects were completed, the country's net investment in capital spending by consolidated general government declined to R76.7 billion in fiscal year 2009/10 (SARB, 2013).

Furthermore, during the 2010/11 fiscal year, the main focus of consolidated general government outlay was on education and skills development, quality healthcare, integrated and sustainable human settlements, and rural development. In fiscal year 2011/12, the country's water, electricity, transport and telecommunication networks were extended to strengthen the communication, education, and health capacity. The country spent R227 billion, which is 20.0 percent of the total government expenditure on education in 2013/14 (SARB, 2013 and National Treasury, 2012).

Owing to poor economic performance, the government has reviewed its spending plans. Government's priorities on policy are achieved through a combination of reallocations and reprioritisations within and across functional groups. It was stated in the 2018 Budget Review that the government would face difficult budget decisions if economic growth were not increased substantially. Since 2012, successive budgets have raised taxes and reduced expenditure growth rates. Government's debt constantly rose as a share of GDP, economic growth also declined, and new government spending burdens emerged (National Treasury, 2018).

The Budget Review endorsed to lower spending ceiling over the medium-term expenditure framework (MTEF) period (2019–2021) by decreasing expenditure on compensation of employees and non-core goods and services. Moreover, the government has planned to reduce main expenditure commitments and their corresponding expenditure but reprioritise fee-free higher education and training introduced in 2017 in line with new policy initiatives. In spite of new expenditure pressures and reductions, the budget remains strongly redistributive. About 68 percent of consolidated expenditure is committed to social services such as education, health, social grants, and other basic services. In total, the country's spending over the medium term is estimated at R5.41 trillion (R1.67 trillion in 2018/19, R1.8 trillion in 2019/20, and R1.94 trillion in 2020/21) (National Treasury, 2018).

2.2. An overview of the South African economy: 1983–2017

The figure 2.1 shows the mixed performance of GDP in South Africa. During the 1980s, South Africa witnessed many political changes coupled with some political and economic instabilities. For instance, the new constitution in 1983 gave birth to the tricameral parliamentary system and the concepts of own and general affairs. Further, the violent uprisings during 1985/86 led to a state of emergency and the intensification of economic sanctions in the mid-1980s. The agricultural sector, too, encountered the "ups" and "downs" of change from the 1980s to the 1990s. The GDP growth rate measures how fast the economy is growing. Between 1980 and 1994, the economy grew only by 1.2 percent a year. This was compounded by negative growth in GDP between 1990 and 1992.

South African economy has increased continuously from 1993; the country contributed to positive GDP growth rates, improved living standards, well-being and access of its citizens to economic infrastructure. The GDP growth trend continued to fluctuate for a while until it reached a negative point in 2008 (-1.5 percent). Two years after the 2008 global crisis, the country experienced an average increase of 4,7 percent in GDP growth.

From 2011, countries experienced a slow growth in GDP. Developed countries experienced poor growth while large developing economies experienced a slightly slower growth. South Africa's economy has struggled to attain growth rates above 2% and remained vulnerable to slow global recovery and, increasingly, to domestic factors.

In 2012, the economy grew by 2.5 percent, but slowed down to 2.2 and 1.2 percent in 2013 and 2014, respectively. Since January 2015, the International Monetary Fund (IMF) has reviewed downwards its forecast of South Africa's growth rate for 2015 (from 2.1 percent to 2.0 percent) and 2016 (from 2.5 percent to 2.1 percent). This forecast lower growth was triggered by domestic factors, which outweighed global economic trends in influencing economic growth. The most volatile contributions to GDP growth have come from the mining and quarrying, and the manufacturing sectors, which are the sectors that historically have been most affected by protests. A constrained electricity supply has also increasingly slowed down growth; emergencies in electricity supply shortages began in 2007 but were officially declared in 2008 and again in early 2014 (FFC, 2016/2017). South Africa's GDP growth rate for 2016 was 0.4 percent, which is a 0.8 percent decline from 2015, while in 2017 it increased by 1.4 percent. The main drivers of this growth were primary sectors particularly the agricultural and mining sectors.

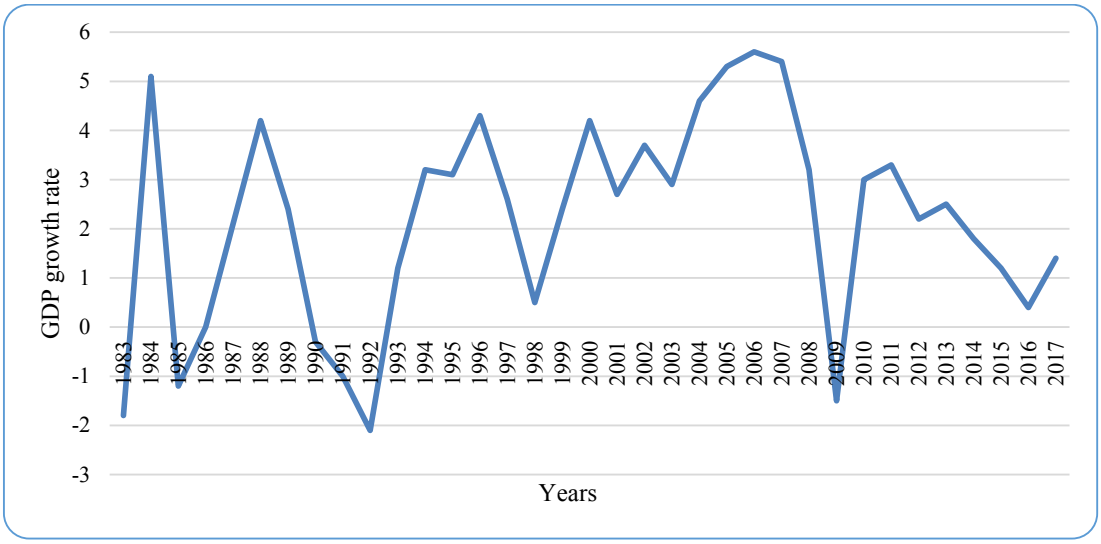

Figure 2. 1 GDP growth rate in South Africa: 1983–2017

2.3. Trend of disaggregated government investment and consumption spending in South Africa: 1983–2017

2.3.1. Spending on education

In South Africa, the government played a significant role in economic activities since 1960, leading to a severe increase in expenditure. Internationally, the government expenditure on education is regarded as the main instrument for enabling society to participate and contribute to an economy, and it contributes a large share to GDP of many countries. During the 1970s and 1980s, the government had to spend more on education, health, housing, safety, and security, while defence expenses grew significantly (Mohr, 2015:338). In the 1980s and 1990s, the education system was characterised by high and rising levels of government expenditure. During such period, the performance of the South African economy declined due to low economic growth as well as an increase in government expenditure. Furthermore, the government had spent over 23.0 percent of the GDP in 1980. This share of government expenditure increased gradually in 1993, reaching an annual peak of 36.0 percent (National Treasury, 2010 and 2015).

The basic education is a parallel responsibility of both the national and provincial government in terms of the Constitution, whereas higher education is the sole responsibility of the national government. Education has been emphasised as one of the top three national priorities. During 1995, the country had endured lengthy increases in education expenditure. Regardless, the contribution of education expenditure to the GDP exhibited an insignificant downward trend from 6.8 percent in 1995 to 5.2 percent in 2001; this level was still above other countries with the same levels of development.

Education usually absorbs the largest portion of the provincial expenditure; however, its provincial expenditure has dropped from 38.5 percent reported in 2001/02 to 34.2 percent in 2004/05 due to expenditure in other sectors, such as health and social development, which grew at a faster rate. In 2013/14, the government had spent R227 billion, 19.7 percent of total government expenditure on education, which is equivalent to 6.5 percent of the GDP. Furthermore, the government increased its expenditure on education by R20 billion between 2012/13 and 2013/14. The country's plans for 2018/19 were to spend R246 billion of total government resources on basic education programmes (National Treasury, 2010–2017).

2.3.2. Spending on health

According to Schellack et al, (2011), South Africa had a high health expenditure and a number of policies coupled with persistently poor health outcomes worse than in many lower-income countries. These poor outcomes and current health policies are attributed to the country's atrocious social and political history. The role of provincial health departments in South Africa is to provide a comprehensive public health service, while the national department's responsibility is to formulate policy, coordinate and support provincial health departments in fulfilling their mandates. Furthermore, the South African health system is dominated by the public health sector, whereas the private health sector mainly provides services to the middle class and above.

Prior to 1994, a relatively low percentage of government expenditure on health was dedicated to basic health services (BHS). Only 12.0 percent of total government expenditure was dedicated to basic health services in 1992/93 and it increased to 20.0 percent in 1995/96. The government then introduced several policies to improve the effectiveness of the health system to improve the BHS. In 1980, the total government health expenditure as a percentage of GDP was 2.3 percent and increased to 3.3 percent in 1997.

Additionally, almost 85.0 percent of government health funding was deposited to provincial health departments in 2004/05. In 2011, the total government health expenditure was 8.3 percent of the GDP, way more than the 5.0 percent endorsed by the World Health Organisation (WHO) and it was deemed high relative to other similar middle-income countries. That was largely due to the high input costs of the government private health sector and the rising disease burden related to the HIV and Aids epidemic. In spite of this high expenditure, health outcomes still remain poor in South Africa. On the other hand, Organisation for Economic Co-operation and Development (OECD) Health Statistics revealed that the total health expenditure in South Africa accounted for 8.8 percent of the GDP, which was marginally below the OECD's average of 9.3 percent reported in 2012 (OECD, 2014).

In 2012/13, the National Treasury allocated R121 billion to health as the budget aimed at improving hospitals and strengthening public health ahead of the National Health Insurance (NHI) scheme. Furthermore, the National Treasury allocated 86.8 percent of the department's total budget to provinces through conditional grants over the medium term. Between 2012/13 and 2018/19, the government increased its spending on health by almost 1.3 percent in real terms. The health expenditure is expected to grow from R170.9 billion in 2016/17 to R217.1 billion in 2019/20, owing to an extended provision of antiretroviral treatments (National Treasury, 2017 and 2018).

2.3.3. Spending on defence

In the early 1960s, the government witnessed wide deviations in defence spending, as a share of the total government spending and GDP, in absolute terms. Defence spending amounted to more than 1 percent of the GDP in the early 1960s, and then increased rapidly in the mid-1960s with the start of the African National Congress's (ANC) armed struggle and the expansion of the South African Defence Force (SADF), which nearly doubled in size between 1960 and 1970. The spending was influenced by economic and political factors between early 1961 and 1989. During 1965, the defence share of the total government expenditure increased from 3.2 percent reported in 1960 to 7.4 percent (Seegers, 1996 and de Wet et al., 1996). However, the government spending decreased slightly during the late 1960s and early 1970s owing to a strong political opposition to apartheid in South Africa and Namibia. Because of the growing internal and external opposition to apartheid, military spending increased again in 1972; it amounted to almost 5.0 percent of the GDP and more than 18.0 percent of the total government expenditure in 1977/78.

During the early 1980s, military expenditure slightly declined as a share of GDP due to a suppressed domestic unrest and an opposition to apartheid. However, the expenditure rose again in the late 1980s to over 4.0 percent of the GDP and almost 13.0 percent of the total government expenditure, but dropped dramatically after 1989. Between 1997/98 and 1989/90, the defence budget declined by more than 50.0 percent in real terms, which is an average of 8.0 percent per annum. The budget declined from nearly 13.0 percent in 1989/90 to 5.4 percent reported in 1997/98 as a share of the total government spending and from 4.0 percent to 1.6 percent as a share of the GDP during the same period.

Social services (education, health, social security, and welfare) and public order and safety (police, justice and correctional services) benefitted from a decline in defence expenditure since 1989/90. Since 1994, the budget for education, health and social security and welfare increased, reflecting a prioritisation of social expenditure. Defence expenditure for public order and safety functional group, which accounted for 14.2 percent of total expenditure, was expected to grow from R190 billion in 2016/17 to R225 billion in 2019/20 at an average annual rate of 5.8 percent. Such expenditure will focus

on fighting transnational crimes, improving policing, supporting peace operations and military health services. The Department of Defence planned to spend R3.3 billion over a three-year period from 2018 to 2020 to safeguard national borders (National Treasury, 2017).

2.3.4. Spending on social protection

Social protection is deemed as a poverty-reducing strategy that can strengthen human development and social cohesion. Barrientos (2012) stated that social protection has proven to positively affect asset protection, productive capacity and accumulation of human and physical capital. It was initially regarded as a response to a crisis; however, the emphasis has shifted gradually to the provision of regular support to vulnerable people facing a shock. In 1980, the South African government enacted the social assistance programs to eradicate racial boundaries. The system of social grants is well-targeted in South Africa. In 1993, poor households were already receiving social grants from the government, a worthy investment that gives people a more desirable and decent life they would hardly realise without the grant.

Since 1994, government policies and involvements have been successful in reducing poverty. The social protection programme is ranked among the largest in developing countries; it also had an exceptionally positive socio-economic effect on poverty and disproportion results in the country. Studies proved that social grants have had a long-term effect on reducing poverty in the country. This holds true because social grants are used in many households as a means to improve health and educational outcomes. Government spending on old-age pensioners increased from 0.6 percent GDP in 1970 to 1.8 percent of GDP by 1993 (Van der Berg, 1997).

In the early 2000s, poverty reduction was strongly associated with an increase in social protection. During 2005–2010, government spending on social protection increased due to an inclusion of more old age grants (by 23.0 percent) and child support grants (by 44.0 percent); this has significantly increased the expenditure on poor households and reduced income inequality for households. About 76.0 percent of government spending on social grants was received by the poorest 40.0 percent of the population in South Africa. Furthermore, the impact of these social grants increased the portion of the total household income from 4.7 percent to 7.8 percent over the period of 2005–2010. In 2018/19, 17.6 million recipients received social grants monthly (National Treasury, 2019).

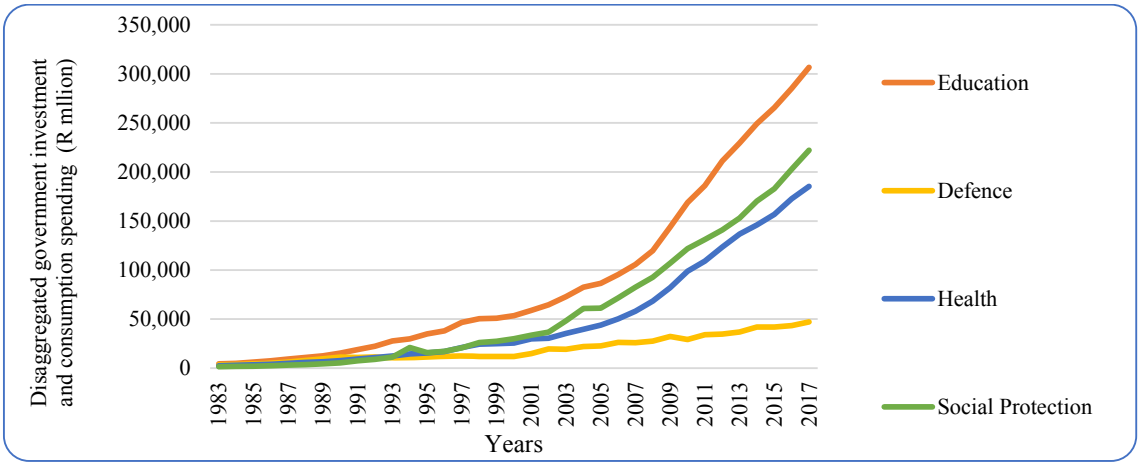

Figure 2:2 Trends in disaggregated government investment and consumption spending in South Africa: 1983–2017

Over the past decades, the country has prioritised spending on socio-economic programs and services; it invested R2.2 trillion in socio-economic infrastructure during that period. Education, health, and social protection are categorised as the top three national priorities. Education received the highest allocation, followed by the social protection, health, and defence sequentially. Since 1993, the government has been spending more on health than on defence; this shows that the government has shifted its major spending from defence to health. Thus, health benefitted from the decline in defence expenditure since 1993/94. The increases in expenditure for education, health, and social protection reflected the prioritisation of social expenditure since 1994 as shown in Figure 2.2.

After the government has transitioned democratically in 1994, it is spending on social protection increased significantly higher than on health and defence. Since then, the government has directed funds into social services and programs to reduce poverty. These services and programs include no-fee schools, free basic services (electricity, water, sewerage, refuse removal, and sanitation) and other forms of social wage (e.g. bus transport subsidies).

The 2010 FIFA World Cup prompted the government to channel substantial resources on social protection from 2009; this boosted domestic activity through infrastructure outlay and increased tourism activity. The spending was higher than that on health and defence since 2010. The government is aggressively fighting a high level of poverty through its massive and well-resourced social grants programme. This programme was deemed one of the most important and wide reaching programmes for a middle-income country, serving to diminish income inequality among the poor, elderly, and disabled. One of its best-targeted grants, the child support grant, has increased more than tenfold since 2000, and it has so far reached to more than 10 million children. Studies showed that child grants

suppressed the global economic downturn in South Africa; they prevented a rise in child poverty levels and kept families and children from sliding into a deeper poverty. South Africa's social grant system was expanded during a period of rapid economic growth.

In the 2018 fiscal year, the government planned to allocate more than half of its expenditure to health, basic education, social protection, and community development over the MTEF. Consolidated government spending is expected to increase at an average annual growth rate of 6.3 percent from R1.8 trillion in 2019/20 to R2.2 trillion in 2022/23.

Spending on education can eradicate pit latrines and unsafe school structures, among others, whereas spending on health can improve service delivery. The social protection function will continue to reduce the level of poverty for the poor by providing them income support over a medium term. Reducing poverty continues to be central to Sustainable Development Goal (SDG) agenda.

2.4. Conclusion

South Africa's long-run economic growth has been slowing alongside productivity. A decade later after the global financial and economic crisis, the country has run large budget deficits, increasing its borrowing and debt-to-GDP ratio to be the highest among its peer countries. The government addressed the global financial and economic meltdown by increasing its expenditure on social and economic programs to improve the quality of education and health care, and to alleviate unemployment and fight transnational crimes and defence services. Nonetheless, this spending has yet not translated into a stronger economic growth. The government continues to prioritise the budget for education, health care, social protection, and defence. Moreover, the government aims to increase accessibility to affordable, quality education and health care and eliminate high levels of poverty by providing income support to poor households. The Budget Review emphasised the importance of shifting government expenditure from consumption to capital investment.

CHAPTER 3.

LITERATURE REVIEW

3.1. Introduction

This chapter discusses relevant definitions, concepts, theoretical and empirical literature related to the study; it underlies the impact of disaggregated government investment and consumption spending on economic growth. Most of the previous studies carried out the impact of total government spending on economic growth, this chapter reviews some literature on the impact of total and disaggregated government spending on economic growth.

3.2. Conceptual issues

Concept of economic growth

Economic growth is defined as the stable process characterised by an increase in the productive capacity of the economy to enhance the national output and income (Mohr, 2015:410). According to Bowden (1992:812), economic growth for any country hinges on the organisation and development of an improved labour force and achievement of more and better capital (e.g. producing or importing more machinery and equipment, building more factories and power plants). Economic growth is characterised by the rate at which the real output increases over time. According to Fourie (1999:212), economic growth is measured by the annual growth rate of real GDP or its annual percentage increase.

Concept of government expenditure/spending

Government expenditure is defined as the money consumed by the public sector through goods purchases and services such as health, education, social protection, infrastructure, and defence. Government expenditure can be classified by function and economical categories; functional classification presents the expenditure in terms of function and sector and economic category categorises it into the consumption or investment expenditure. Consumption expenditure refers to the expenditure on goods and services by households, whereas investment expenditure refers to the production and purchases of productive capital goods (Mohr, 2015:290, 317 and 322).

GFSM, (2014) defined government expenditure as costs incurred to the government for the provision of services such as education, defence, administration and maintenance of itself as an organisation and maintenance of the country's economy. Government expenditure also entails spending on transfer payments to pensioners, the unemployed, and the disabled; spending on subsidies and grants to the

industry; and payment of debts. In literature, the terms of government expenditure/spending and public expenditure/spending are closely related and are therefore used interchangeably.

3.3. Theoretical review

Government spending is regarded as the most vital tool of fiscal policy that improves economic expansion and growth. It effect on economic growth has been deliberated widely and it has been a subject of an intense debate between the two well-known schools of thought, namely Keynesian theory and Wagner's law. Keynesian schools of thought believed that a vigorous fiscal policy is a significant tool to increase economic growth and activity. By increasing the government expenditure and reducing taxes, the government can balance the rate of economic activity to be slower; hence, fiscal policy was regarded as a counter-cyclical policy instrument that alleviates short-run variations in employment and output. In addition, government expenditure was deemed an exogenous variable used to increase economic growth. The economy that operates without government involvement will fail as it was witnessed during the United States of America (USA) Great Depression in 1939 (Keynes, 1936).

According to Keynes (1936), government spending has a positive impact on economic growth and therefore the causal relationship runs from government spending to economic growth. This was intensely rejected by Wagner's law which considers government spending as an endogenous variable that can be used to propel the economy rather than a cause of economic growth. Wagner's law believed that there is a presence of the causality between government expenditure and national income that runs from national income to government expenditure. The law supports forcible government intercession in the economy to boost the demand for goods and services and economic growth (Keynes, 1936).

In addition to the above schools of thought, Solow-Swan (1956), in his neoclassical growth model, argued that there is no long-run effect of government outlays on national output. The growth model declared that fiscal policy could not change economic output in a long-run growth. The long-run growth rate was reportedly driven by labour force, population, and technological growth rates determined exogenously. However, a vigorous government intercession may induce failure attributable to the inadequacies of the market (Solow-Swan, 1956). Discussed below are the theoretical underpinnings by the Keynesian theory, Wagner's law, Peacock and Wiseman's political constraint model, Musgrave-Rostow's theory and Endogenous growth theory.

3.3.1. Keynesian theory

Amongst all economists who debated the link between government expenditure and economic growth, Keynes was renowned for his opposing viewpoints on the relationship between government spending and economic growth. Keynes (1936) considered government expenditure as an exogenous factor that

can be used as a policy tool to increase economic growth through its multiple effects on aggregate demand. Keynesian theory maintained that the significance of aggregate demand for goods was one of the factors that were the driving force of a country's economy, particularly during periods of economic downturn. Keynes maintained that the government was accountable for bringing a country out of depression (Keynes, 1936).

Keynes (1936) argued that if government expenditure increases, society would be persuaded to disburse more money because more of it would be circulated. The society would then be encouraged to invest more and the economy would grow in return. The theory suggested that the causality runs from the government expenditure to economic growth. Government expenditure can positively contribute to the growth through the multiplier effects on aggregate demand (Keynes, 1936). However, the neoclassical growth theory opposes Keynesian's view and argues that government spending does not have an impact on the economic growth. The growth theory concluded that changes in government expenditure do not bring change in output, but changes in three driving forces-labour, capital, and technology significantly affect economic growth. The Keynesian theory further proclaimed that government expenditure, particularly deficit financing, might provide a short-term incentive to stall a recession. Keynes, however, recommended that policy makers make provisions to minimise government spending once the economy improves to forestall inflation.

According to the Keynesian view, governments could depend on the private sector to strengthen the economy. For instance, the government could borrow money and then return it on different spending programmes. In general, government spending may have a positive effect on national income if there were high levels of government consumption which affect aggregate demand. On the other hand, classical economists believe that government intervention brings more harm than good to an economy and that most activities should be entrusted to the private sector. Classical economists argued that the government should perform limited functions such as promoting and maintaining law and internal security to settle quarrels among its citizens. Classical economists view government's involvement in the economy as a thread to economic growth (Adam Smith, 1776).

3.3.2. Wagner's law theory

Among the demand side models of government expenditure growth, the most frequently cited theory is Wagner's law of expanding government activities. Adolph Wagner hypothesised an empirical law theory to examine and explain the trend in the growth of government expenditure. Wagner's law was the first government expenditure theory in the history of public finance. The law stated that during the economic development process, the ratio of government expenditure in the economy tends to increase at a rate higher than that of economic growth. Adolf Wagner argued that government expenditure plays an

insignificant role in improving economic growth; by contrast, the causality runs from economic growth to government expenditure. Government expenditure will continue to stimulate economic growth to increase the well-being of its citizens. Furthermore, a sustained government expenditure will result in increased investment in education, employment opportunities, better quality of physical infrastructure, as well as a sustained economic growth (Wagner, 1883).

3.3.3. Peacock and Wiseman's political constraint model

In 1961, Peacock and Wiseman conducted a seminal study of the growth in government spending in the United Kingdom (UK) for the period 1891–1955. Peacock and Wiseman's (1961) theory originated from a study hypothesised on Wagner's law; they were among others who criticised Wagner's law. They rejected Wagner's organic state theory and maintained a political hypothesis that the government likes to disburse more money, while the society feels hostile towards paying more taxes, and that the government must consider the wishes of its people. The theory stated that government activities may increase, but not as Wagner hypothesised (Peacock and Wiseman 1961:17). The theory further stated that government expenditure depends heavily on revenue collection. According to this theory, industrialisation, which causes increased government spending, also improves revenue collection, mainly through taxation used to finance government expenditure. Political theories of government expenditure and hypotheses such as those of Peacock and Wiseman as well as Wagner, among others, helped describe how government spending increases. Peacock and Wiseman's hypothesis can be clearly explained with the help of a diagram as shown below.

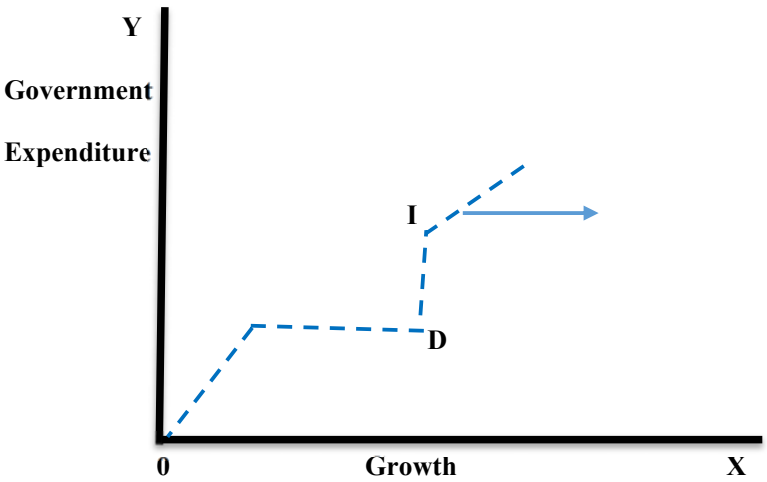

Figure 3.1 Peacock and Wiseman's hypothesis

In the above diagram, the growth rate is represented on the **'X'** axis and government expenditure on the **'Y'** axis. Peacock and Wiseman were of the view that government expenditure grows in a step-like

pattern to reflect the differences in government expenditure patterns during both social upheaval and calmness periods. Peacock and Wiseman's hypothesis provided special effects in an economy: ***(1) Displacement effec*t** explains the time path of the economic growth in democratic countries. Displacement effect is characterised by a social upheaval (such as war, resource scarcity, political instability, and social disaster) in different periods, which destabilises the economy. When social upheaval periods occur, the government raises taxes to increase revenue and spends more to counter the effects of social upheaval; however, this leads to displacement because low taxes and expenditure are replaced by higher taxes and expenditure. The economy will therefore change its current position in public finance. Point **'D'** in the graph signifies the displacement effect (Peacock and Wiseman, 1961:27). During calm periods, government expenditure exhibits a steady upward trend (Aigheyisi, 2013). ***(2) Inspection effect*** – Point **'I'** in the graph signifies the inspection effect. During this period, government increases its fiscal operations to improve social disturbance and economic activities. Peacock and Wiseman added the third effect, namely ***(3) concentration processes*** associated with changes in management of government expenditure. The study witnessed displacement periods lowering obstacles that prevent local autonomy and thus raise burdens for increases in the concentration of power over government expenditure in the hands of the central government.

When the displacement effect occurs, government expenditure increases and the inspection effect also raise the taxes, thus resulting in the stabilisation of the levels of government expenditure and taxes to an advanced level until another social upheaval triggers the displacement effect. When an economy grows, central economic activities increase at an accelerated rate than the rate of economic activities of other tiers of government (Peacock and Wiseman, 1961:28-29).

3.3.4. Musgrave and Rostow's theory

Musgrave-Rostow's theory takes the view that government expenditure is a requirement for economic growth and development in societies. Government investment as a proportion of the total investment is higher in the early stages of economic growth and development (Musgrave and Rostow, 1961). The cause for the high proportion of government expenditure is due to the government delivering social infrastructure expenditures such as health facilities, education facilities, transport and road infrastructure, sanitation services, law and order as well as other investments in human capital, which are all essential for the growth of the society. Therefore, government expenditure will rise steadily as most of these projects are deemed to be capital intensive (Edame and Fonta, 2014). At later stages of economic growth and development, institutions for private capital formation become more advanced and hence the proportion of government expenditure might decrease (Musgrave 1969:76-77). The areas that government invests in, such as health education, roads, electricity, and water supply, are necessities that can promote the economy from the traditional stage to the take-off stage of economic development.

Therefore, increased government expenditure results in high economic growth and development (Likita, 1999; Edame and Fonta, 2014).Endogenous growth theory

The endogenous growth model, adopted by theorists such as Barro (1990), predicted that productive expenditure and distortionary tax would affect long-run growth rates. Barro includes productive government expenditure in his model, which allows for long-run endogenous growth, and it also allows for long-run growth effects of the government fiscal policies. The theory explains and provides a mechanism on how government fiscal policies may induce positive effects in the long-term economic growth given the government expenditure. The model has gone beyond Solow's neoclassical growth model that demonstrated diminishing marginal returns to capital and labour separately and returns to scale to both factors jointly and that left technological advancement as a residual.

On the contrary, the Solow-Swan (1956) growth model proclaimed that it is the development of population and the rate of technical progress that drives economic growth in the long-run. Therefore, the endogenous growth theory has covered the missing explanation of long-run growth. Endogenous growth theory explains changes in technological progress by assessing the role of investment in research, training, and education by firms and the role of government policies in changing incentives to stimulate both human and physical capital. For example, subsidies for research and development or training and education escalate the growth rate in some endogenous growth models by improving the incentive for innovation. The endogenous growth theory has significantly contributed to reviving the investigation of the determinants of long-term growth (Barro, 1990; Barro & Sala-i-Martin, 1992).

3.4. Empirical review of literature

Studying the impact of government expenditure on economic growth has been vital in predicting future economic growth. Numerous empirical studies have examined the impact of government expenditure on economic growth by employing different methodological techniques, time frames and data models. However, the results and evidence of these studies differ according to the analytical techniques employed, from country to country, and depend on periods being analysed, including model specifications and government expenditure classifications. Some of the conclusions seem to be that some levels of government expenditure matter, and favour the growth development, but there are still many arguments and mixed evidence to support such. Economic theory does not automatically produce robust and conclusive conclusions on the impact of government expenditure on economic growth. As a result, no consensus has been reached.

The literature indicates negative, positive, and no significant effects of government expenditure on economic growth. Empirical studies that showed negative or no significant results about the effects of government expenditure on economic growth include Landau (1983, 1986); Kormendi and Meguire

(1985), Grier and Tullock (1989); Barro; (1990, 1991); Romer (1990); Engen and Skinner (1992); Kweka and Morrissey (2000); Folster and Henrekson (2001); Al-Faris (2002); Akpan (2005); Mitchell (2005) and Olopade and Olopade (2010).

The studies conducted by Ram (1986); Grossman (1988); Aschauer (1989, 1990); Holms and Hutton (1990); Barro and Sala-i-Martin (1992); Easterly and Rebelo (1993); Gramlich (1994); Fajingbesi and Odusola (1999); Brons and Njikamp (1999); Komain and Brahmasrene (2007); Dash and Sharma (2008); found a positive association between government expenditure and economic growth. The research study started with global studies, followed by African studies and end with studies on South Africa. Some of the empirical studies that examined the impact of government spending on economic growth are reviewed below.

Landau (1983) conducted a study for 104 countries using cross-section data over the period of 1960–1977 and discovered that the share of government consumption expenditure hinders economic growth. Landau (1986) confirmed the assertion of the negative effect of government expenditure on economic growth. The results obtained by Landau (1983, 1986) correlate with the results by Barro (1990, 1991). However, the results conflict with Ram (1986) and Carr (1989) findings. These researchers, through empirical studies, discovered that growth in government size was positively linked with growth.

Similarly, Baum and Lin (1993) examined the differential effects of diverse classification of government spending on national income in 58 countries. Government expenditure on education and agriculture was found to have a significant positive effect on growth, whereas spending on welfare had a negative and insignificant effect on growth. Another study that found a positive and significant effect between expenditure on education and labour training was carried out in the USA over the period 1952–1991 by Cullison (1993). On the other hand, Carter, Craigwell, and Lowe (2013) revealed a significant and negative association between government education expenditure and economic growth in the short- and long-run. The research study examined the association between the components of government expenditure and economic growth in Barbados over the period 1976–2011.

The growth rate of defence expenditure had a significant positive effect on one subset of the country but insignificant for the other subset. Dunne and Nikolaidou (1999) applied time series data on Greece over the period of 1960–1996 and variables tested were government consumption and expenditure on defence and military. The study employed ordinary least squares (OLS) and cointegration analysis. Defence expenditure was found to have a harm economic growth and government consumption did not affect growth. Another study that found a negative impact between military spending and growth was carried out by Smith (1980).

Kocherlakota and Yi (1997) empirically examined how public capital (physical capital variables) and taxation affect GDP in the United States of America (USA) and the United Kingdom (UK) over the period of 1891–1991 and 1831–1991, respectively. The study used OLS estimation techniques and revealed that government capital positively improved economic growth, while taxes hampered economic growth. Knoop (1999) through the application of regression analysis and time series data explored the impact of government size on economic growth for the USA economy spanning from 1970–1995. The research findings showed that a decrease in public spending created adverse effects on growth and welfare.

Mitchell (2005) discovered that there is an adverse relationship between the size of the government and economic growth. The study also maintained that the USA public spending had increased so much in the last few years and had significantly given rise to negative growth. The study recommended that a government should reduce expenses on projects or programmes that yield minimal gain to citizens or bear higher costs. The results further confirmed that government programmes economically discourage desirable decisions. Akpan (2005) used time series techniques to examine how the some components of public spending (administrative, economic services, capital, recurrent, social and community services and transfers) relates with the economic growth and found that the relationship is insignificant.

Loizides and Vamvoukas (2005) used annual data from the UK, Greece and Ireland to study the association between the growth of government size and an increase in income. Cointegration analysis, error correction model (ECM) and Granger causality tests were employed. The findings showed that the government expenditure for the selected countries Granger causes economic growth in both the short- and long-run. The rates of growth effect of the government have been beneficial, which means that government spending promotes inclusive economic development. Komain and Brahmasrene (2007) applied the Granger causality test to investigate the correlation between public expenditure and economic growth in Thailand and discovered that the aggregate expenditures trigger growth in the economy, but income growth does not expand the aggregate expenditure. Government spending and growth were not cointegrated; this signifies the absence of a long-run linkage between the two variables. The study also showed the existence of a unidirectional relationship between two variables that causality runs from government spending to economic growth. Furthermore, the study found a positive and significant impact of government spending on economic growth.

Al-Yousif (2000) showed a significant positive effect of public spending on economic growth in Saudi Arabia. The study assumed that public spending in the social sector plays a significant role in improving economic growth by preserving law and order, providing economic infrastructure, , and accelerating labour efficiency through education and health. Another study conducted in Saudi Arabia over the period of 1970–1999 was done by Al-Qudair (2002), where the Engle-Granger cointegration method

was used to determine the association between different measures of government spending and the real GDP. The study found evidence that is in line with Wagner's law that public spending was mainly impacted by economic growth. Khosravi and Karimi (2010) also contributed to the literature by conducting a study to relate public expenditure and economic growth. The study used the Auto-Regressive Distributed Lag (ARDL) method of cointegration in Iran over the period of 1960–2006. The results showed that these variables relate.

Using the Johansen cointegration technique, Szarowská (2011) also revealed a positive correlation among economic growth and the total public expenditure, economic affairs expenditure and public order, and safety expenditure in the Czech Republic during the period of 1995–2008. The positive and significant association between government education spending and economic growth was supported by the research findings by Mercan and Sezer (2014). The study was conducted in Turkey over the period 1970–2012. Mallick et al. (2016) employed the Pedroni cointegration test and the fully modified OLS and panel VECM to determine the effect of government education spending on economic growth in Thailand during the period 1973–2012 and found a significant positive effect of education expenditure on economic growth. On the contrary, Kouton (2018) found a negative and statistically significant association between government education expenditure on economic growth in the long-run.

The study conducted by Sáez, García and Rodríguez (2017) provided new evidence of the impact of public spending on economic growth in the European Union (EU) countries over the period 1994–2012. Linear regression and standard panel techniques for econometrics were used to analyse cross-section panel data. The study found an insignificant association between public spending and economic growth in the EU countries. Furthermore, Alexiou (2009) used two different panel data for seven transition economies in South Eastern Europe and different outcomes were reached which articulated that government expenditure on private investment, capital formation, development support and trade liberalisation have a significant positive impact on growth, while population growth showed a negative impact on economic growth.

Pegkas (2018) empirically examined the association between public debt and national income in Greece. The issue of break effects between public debt and economic growth was addressed and found out that the association between public debt and growth depends on the debt breaks. Particularly, at government debt levels prior to 2000, the rise in the public debt-to-GDP ratio was deemed to have no significant impact on growth. Conversely, as debt increases after 2000, the effect of public debts on economic growth was swiftly reduced and the growth consequences become negative.

Ahmad (2014) conducted a study to examine the long-run association between public spending and growth. Cointegration with ADF test and Engel causality tests were employed to test the long-run

association between public spending and economic growth using annual data from 1980–1981 to 2012–2013 in India. The results showed the existence of cointegration between public spending and economic growth. There was a unidirectional causality running from public spending to economic growth, which is consistent with the Keynesian theory. Additionally, Dash and Sharma (2008) used time series method to analyse the impact of government spending on economic growth and found a positive link between these two variables in India over the period of 1950–2007.

Abdieva, Baigonushova, and Ganiev (2017) examined the association between public spending and GDP in the short-run and long-run. The study employed the Engle-Granger cointegration and Granger causality of two transition economies in Kyrgyzstan and Tajikistan; the quarterly data was used from 2000:1–2013:4. The outcomes of the Engle and Granger cointegration test showed the existence of a long-run association between GDP and public spending in both countries. The outcomes of the Granger causality test revealed unidirectional causality from public spending to GDP in Kyrgyzstan. These results support the Keynesian view that causation runs from public expenditure to growth. However, the study did not find any evidence of causal association between public spending and growth in Tajikistan.

Olugbenga and Owoye (2007) conducted a study on a group of 30 OECD countries over the period of 1970–2005. Total expenditure and economic growth as variables of interest. The study employed cointegration and Granger causality tests to discover the existence of a long-run relation between the two variables. Likewise, Lamartina and Zaghini (2008) used panel cointegration analysis to determine the impact of public spending on GDP in 23 OECD countries. The research findings showed a positive relation between public spending and per-capita GDP and the findings were consistent with Wagner's law. In addition, the results revealed that public spending was impacted by the growth in economic activities. Another study on OECD countries by Heitger (2001) discovered that public spending on public goods has a growth effect but this effect decreases when the governments exorbitantly provide private goods.

In another empirical analysis, Connolly and Li (2016) used panel data for 34 OECD countries over the period 1995–2011 and applied a generalised method of moments (GMM) estimation technique to resolve the discrepancy between fixed and random effects panel estimation. The GMM estimation result displayed that government consumption spending and investment have an insignificant effect on economic growth. Moreover, an increase in government social expenditure has a negative growth effect. The study carried out by Diamond (1989) used panel data of 42 developing countries in Africa and Asia to determine the link between government expenditure and growth. The variables used in the study were health and education expenditures. The findings from the study revealed that health and education expenditures have a significant positive effect on growth in a short-run. On the other hand, a direct

relationship was found between infrastructure and education. The study found that education allows for more training and better access to learning skills and the quality of education and enrolment rates tend to improve with improved transportation networks – particularly in rural areas. Better access to clean water and sanitation in schools tend to increase attendance rates (Stiglitz, 1989).

Devarajan, Swaroop and Zou (1993) empirically investigated the association between the composition of government expenditure and economic growth, using annual data on 69 countries from 1970–1990. The results showed that components of productive expenditure such as education, health, capital, communication and transport had an insignificant negative association with national income. While a significant positive coefficient was found between recurrent expenditure and economic growth. The study further found out that preventive care and other education (which are part of health and education sectors) had a positive coefficient in the regression with economic growth. Furthermore, the study carried out by Jong-Wha Lee (1995) used pooled cross-section data on 113 countries and revealed that government consumption expenditure and economic growth were associated with the economic downturn.

Ghura (1995) found the negative relationship between the share of government consumption expenditure and economic growth. The study used cross-section and pooled time series data for 33 sub-Saharan Africa over the period of 1970–1990. Similar findings of a negative link between two variables were made by Guseh (1997). The research study used time series data for 59 developing middle-income countries over the period of 1960–1985. Yasin (2008) used panel data for sub-Saharan Africa for the period 1987–1997 and reached similar results that public spending on private investment, capital formation and trade liberation had a significant positive impact on national income. Cooray (2009) tested the association between the government size, the quality of service provided by the government and economic growth in a cross-section study on 71 countries. The research results showed that the government size and the quality of government service are important in explaining the changes in economic growth.

Hanif (2018) empirically examined government spending and economic growth on the 10 selected countries in sub-Saharan Africa (South Africa, Botswana, Equatorial Guinea, Mauritania, Nigeria, Sierra Leone, Tanzania, Ethiopia, Madagascar, and DR Congo). The study tested five variations of Wagner's law over the period 2005–2014 using panel econometric approaches including cointegration and causality. The research study followed the models of Peacock-Wiseman (1961), Gupta (1967), Goffman (1968), Musgrave (1969) and Mann (1980) and found a long-run association between the government spending and several explanatory variables used as proxies of national income. The long-run causality tests showed that there is bidirectional causality between government spending and national income in all models except Gupta (1967) model. Both Wagner's law and Keynesian theory

were found to be valid in sub-Saharan Africa. There has been an inclination for public expenditure to grow relative to national output (Wagner's law) and that public expenditure is a policy tool (an exogenous factor) for improving economic growth (Keynesian theory).

The study by Abu and Abdullahi (2010) corroborates the findings of Al-Shatti (2014) that the impact of recurrent and capital expenditure on education did not generate growth. In contrast, Kabuga and Hussaini (2015) extended the idea that recurrent and capital expenditure on education has positively influenced economic growth. Additionally, Adamu and Hajara (2015) found a significant positive impact of recurrent expenditure on economic growth, while capital expenditure had a positive and insignificant impact on growth. A study conducted by Oluwatoyin and Fagbeminiyi (2010) in Nigeria used econometric methods to determine how health, education, and labour productivity relate on growth. The regression results provided evidence that showed a positive impact between recurrent and capital spending on health and recurrent spending on education as well as labour productivity, while capital spending on education has little or no effect on labour productivity.

Nworji et al. (2012) used OLS to determine the effect of public expenditure on economic growth in Nigeria and found a positive link between public expenditure and growth in Nigeria over the period 1970–2009. Another positive effect was empirically proved by Al-Bataineh (2012). The study used time series data to determine the link between public expenditure and economic growth in Jordan over the period 1990–2010 and discovered a positive relation between the two variables. Al-Mazrouei and Nejmeh (2012) also reported a positive and statistically significant association between public expenditure and output level. Modebe et al., (2012), researched the assessment of the effect of government spending on economic growth in Nigeria over the period 1987–2010. The results revealed that a recurrent government expenditure had an insignificant positive impact on economic growth, while the capital expenditure had an insignificant negative impact on economic growth.

Study carried out by Al-Fawwaz (2015) discovered contradictory outcomes in a study that was conducted for the Jordan economy during the period 1980–2013. The study discovered a significant positive link between the growth in both total and current government spending and economic growth. Conversely, capital government spending was insignificantly linked to economic growth. In the same vein, Aigheyisi (2013) found opposite results that revealed that recurrent expenditure has a significant negative effect on growth, while capital spending was positive. The research study by Nkechukwu and Okoh (2013) has analysed capital spending on health, education, agriculture, and road construction by applying the OLS multiple regression model to predict Nigerian growth over the period 1981–2013. The study showed that there is a positive and long-run association between economic growth and capital spending on education and road infrastructure. At the same period, which there was a negative and long-run association between economic growth and capital expenditures on agriculture and health.

Robinson, Eravwoke and Ukavwe (2014) conducted a study using the ADF test and OLS technique to empirically examine the association between public expenditure and economic growth. The government expenditure was disaggregated into spending on health, education and public debt expenditure. The findings showed an inverse association between government health expenditure and economic growth, whereas government education expenditure was deemed inadequate to transform into growth and development in Nigeria. Okoro (2013) also carried out a study for a period 1980–2011. The study used the OLS multiple regression analysis to determine the impact of government spending on the Nigerian economy. It was revealed that there is a long-run relationship between government spending and economic growth.

Empirical evidence provided by Anning, Haisu, and Ritito (2017) on the effect of public spending on economic growth in Ghana over the period 1980–2015. The study employed the ARDL bounds testing method to cointegration and the VECM-Granger causality was employed to evaluate both short-run and long-run parameters together with the direction of causation. The empirical results revealed a long-run association between public spending and economic growth. In addition, the Granger causality tests showed causal independence between two variables in the long-run. Maingi (2017) used the cointegration tests to reveal a positive long-run relationship between economic growth and selected components of government spending: education, defence, economic affairs, health, public order, government investment, national security, government consumption, general administration, services, and physical infrastructure). Granger causality test also revealed a bidirectional causality between the components of government spending and economic growth. Spending on economic affairs, education, defence, physical infrastructure, government investment, general administration, and services has shown positive effects on economic growth in the long-run. In the short-run, however, health care, national security and public order have revealed a growth effect, while public debt servicing had a negative growth in Kenya for the period 1963–2008.

Another empirical study conducted in Kenya for the period 2006–2015 used the ARDL technique to investigate the short-run and the long-run impact of public debt on growth. Empirical results revealed that in the long-run debt services have a significant impact on sectoral growth and no effect was found in the short-run (Molonko, Jagongo and Omagwa, 2018). Moreover, Okombi (2018) examined the contribution of government spending and its components towards economic growth and found out that an overall government spending has a growth effect in the long-run. However, the study did not find a growth effect in the short-run in Congo. The study conducted by Dereje (2017) used time series data of 1970/71–2010/11 and revealed that all components of government spending have no significant impact on the Ethiopian economy in the short-run.

In the study based on South Africa, Ncanywa and Masoga (2018) found an adverse relation between public debt and economic growth and quarterly data was used over the period 1994–2016. The study employed the ARDL, Granger causality, variance decomposition and impulse response in the analysis. The existence of the bidirectional Granger causality relationship between public debt and economic growth was found in the analysis. Another study that revealed an adverse relation between government debt and economic growth was carried out by (Mhlaba and Phiri, 2018). The study applied the ARDL technique to investigate the short-run and the long-run impact of public debt on economic growth was conducted in South Africa over the period 2002: Q2 to 2016: Q4. Additionally, Kularatne (2006) revealed that economic infrastructure investment has both direct and indirect influences on economic growth through private investment in South Africa. A direct positive impact was found between social infrastructures on gross value added (GVA). Younis (2014) empirically proved yet another positive impact of infrastructure investment on growth in Pakistan. The investigative findings showed a significantly positive and long-run impact of social infrastructure investment on economic growth. Conversely, economic infrastructure investment negatively affects economic growth.

Alm and Embaye (2011) conducted the growth of government expenditure per capita in South Africa during the period 1960–2007 by applying multivariate cointegration techniques. Their findings confirmed that government expenditure per capita, income per capita, wage rate and tax share are cointegrated. Cointegration results supported the view that government expenditure per capita was linked with per capita income as well as the literal cost of government service delivery as given by the wage rate and to the financial delusion triggered by budget deficiencies, which make voters disregard the real cost of government service delivery. Ocran (2011) used quarterly data to examine the effect of fiscal policy variables (Gross Fixed Capital Formation (GFCF), government consumption expenditure, and tax expenditure and budget deficit) on economic growth in South Africa over the period 1990–2004. GFCF and government consumption expenditure were deemed to have a positive and statistically significant impact on economic growth; however, the size of the impact on government GFCF was less than that attained by the government consumption expenditure.

Ncanywa and Makhenyane (2016) also conducted a study in South Africa for the period of 1960–2014 using the Johansen cointegration and vector error correlation model (VECM) to investigate the effect of investment activities as measured by GFCF on economic growth. It was discovered that GFCF was positively linked with growth in both the short- and long-run. The study also found bidirectional causality between GFCF and economic growth. Gadinabokao and Daw (2013) empirically examined the association between government spending and economic growth in South Africa over the period 1980–2011. OLS regression techniques, cointegration, ECM and pair-wise Granger causality econometric approach were utilised to examine the time series data in the model. The results also

confirmed that there is a positive long-run association between the two variables and further showed that GFCF Granger causes economic growth.

Chipaumire et al., (2014) used quarterly data to study long-run relationships and causality between government spending and economic growth in South Africa over the period of 1990–2010 and found a negative relationship between the two variables. The results were inconsistent with the Keynesian theory, which states that government spending has a positive effect on the national income. On contrary, the study conducted by Dandan (2011) employed annual time series data for the period of 1990–2006 and found that at an aggregate level, the effect of government spending has a positive impact on economic growth in Jordan, which was discovered to be in line with the Keynesian theory. Study carried out by Mosikari and Matlwa (2014) investigated the link between government defence expenditure and economic growth in South Africa for the annual time series data from 1988–2012. The study employed Johansen cointegration, Engel-Granger, and Granger causality. The results revealed evidence of the long-run association between the two variables. Furthermore, military expenditure was deemed to Granger cause GDP per capita.

Leshoro (2017) used the ARDL technique to explore the effects of government investment spending and government consumption spending on the South African economy over the period 1976–2015. Disaggregated government spending was positive and significantly linked to economic growth both in the short-run and the long-run. Bose, Haque and Osborn (2003) empirically investigated the effects of public spending on growth at disaggregate levels for a panel of 30 developing countries over the period 1970–1980. The study found the share of government capital spending to have a positive growth effect, however, government current expenditure had no growth effect. At the disaggregated level, government investment in education and total expenditure in education were significantly linked with economic growth when the budget constraints and eliminated variables were taken into consideration. Likewise, Molefe and Choga (2017) re-evaluated the link between government spending and economic growth in South Africa over the period of 1990–2015. The study employed the VECM and Granger Causality method and the variables of interest were GDP, government spending, national savings, government debt and Consumer Price Index (CPI). The findings revealed a negative relationship between government spending and economic growth in the long-run. Consistent with the supporting Wagner's law for South Africa, the Granger causality test results revealed that the causal relationship runs from economic growth to government spending.

Oladele, Mah, and Mongale (2017) studied the role of government expenditure towards the South African economy from 1980–2014 applying the cointegration method and VECM. The cointegration test results showed a long-run association between the two variables. The VECM results revealed a significant and positive association between the two variables in the long-run. The results also found a

positive and significant association between foreign exchange rate and economic growth and a negative and significant association between economic growth and private consumption in the long-run. However, the study found a negative significant association between government spending and economic growth in the short-run. Furthermore, the study revealed the existence of a causal association that runs from economic growth to government spending, which corroborates Wagner's law in South Africa. Molefe (2017) revealed a negative long-run relationship between government spending and economic growth. The study further revealed that the causality relationship runs from economic growth to government spending, which is also in line with Wagner's law in South Africa.

3.5. Literature gap

There are considerable research done previously on the impact of either the aggregated or disaggregated government expenditure in South Africa. Some research studies (Chipaumire et al., 2014; Molefe and Choga (2017); Mosikari and Matlwa, 2014; Odhiambo, 2015; Ncanywa, and Makhenyane, 2016) have brought increasing attention to the importance of the subject matter knowledge and provided analysis of effect of aggregate and disaggregated government spending on South African economy. However, some findings from these studies do not tell as much as the decomposed variable about the impact of government spending on economic growth, and how each component affects economic growth. To fill this gap, the present study seeks to decomposing variables of interest and further describe how each component affects economic growth in South Africa. To achieve this, annual time series data spanning the period of 1983–2017 is used. Therefore, the present study was designed to contribute to the ongoing debate on this subject matter.

3.6. Conclusion

Theoretical and empirical studies on the impact of government investment spending on economic growth have been thoroughly conducted but have not produced strong conclusions. Studies that were conducted about the impact of government investment spending in South Africa revealed mixed results owing to methodological differences, estimating procedures, model specifications, study variables, sample size and type and period of estimation.

Some studies contend that government expenditure hinders economic growth, while others maintain that government expenditure is influential in stimulating economic growth. The demand-side believers argued on the positive relationship between the level of government expenditure and economic growth. They believe that growth in government expenditure escalates and enhances the quality of public services (health services, education, housing and social welfare) provided by the government to their citizens and boosts the development of the infrastructure, which is crucial for investment, thereby

encouraging economic growth, (Al-Shatti, 2014). Conversely, this judgment is in contraction with the supply-side view, which maintains that an increase in public spending decreases economic growth.

These study results can be used by researchers and spheres of government to reformulate government policies that can produce needed economic growth that is in line with radical economic transformation programmes. These scholarly studies prove that the influence of government investment spending on economic growth can be either positive or negative. The relationship between government spending and economic growth is not distinct. All of the aforementioned studies support either the Keynesian hypothesis or Wagner's law.

CHAPTER 4.

RESEARCH METHODOLOGY

4.1. Introduction

This chapter provides the research methodology applied in analysing the impact of disaggregated government investment and consumption spending on economic growth in South Africa. It provides an explanation of the research philosophy as well as the epistemological and paradigmatic perspectives informing the study. The theoretical framework and empirical model underpinning the study are described. This chapter also outlines the data description, collection, and methods of analysis. The research design and methodology chosen both focused on finding accountable answers to the research questions.

4.2. Research design

The research design is the researcher's overall plan for attaining answers to the research questions guiding the study. Burns and Grove (2001:223) state that designing a study helps researchers to plan and implement the study in a way that will help them obtain the intended results, thus increasing the chances of obtaining information that could be associated with the real situation. The study employed quantitative research design that followed descriptive research. Descriptive research is an appropriate choice because the purpose of the study is to investigate the impact of disaggregated government investment and consumption spending on economic growth in South Africa. Furthermore, descriptive research has allowed for various types of information and data to be collected in the study. Most importantly, the descriptive research enabled the study to test factual hypotheses. Moreover, the study employed secondary research to answer the research questions posed in chapter one. Secondary research is an appropriate choice because the study focused on a specific period that required analysing historical data. It included information and data that have been collected by other researchers or institutions such as, official government policy, academic books, academic journals as well as internet-based articles.

4.3. Theoretical framework of the study

The theoretical framework applied in the study is based Keynesian model. Keynes (1936) considered government expenditure as an exogenous factor that can be used as a policy tool to increase economic growth through its multiple effects on aggregate demand. The Keynesian modeled economic growth as a function of government expenditure

GPk= f (GEP/GDPt)…… (4.1)

Aggregate government expenditure as a function of the sum of all government expenditure components.

GEP/GDPt= f (government expenditure of all categories)…….(4.2)

Where:

GEP= government expenditure;

GEP/GDP=government expenditure as a percentage of GDP.

The theoretical framework is appropriate because it includes components of economic growth that can be verified empirically and examines the relationship between government spending and economic growth.

4.4. Empirical model specification

The Keynesian model, which states that an increase in public spending accelerates economic growth, was adopted in line with the objectives of this study. The study used real GDP as a proxy for economic growth.

The model is of the study is expressed as follows:

GDP= *f* (EDU, HLTH, DEF, SP, INV and INFL)……..……..……. (4.3)

Government expenditure is part of the GDP.

The variables are further expressed linearly as follows:

$GDP_t = EDU_t + HLTH_t + DEF_t + SP_t + INV_t + INFL_t + \varepsilon_t$……..... (4.4)

Linear transformation of the logarithmic form of the model is as follows:

$InGDP_t = \beta_0 + \beta_1 InEDU_t + \beta_2 InHLTH_t + \beta_3 InDEF_t + \beta_4 InSP_t + \beta_5 InINV_t + \beta_6 InINFL_t + \varepsilon_t$……..... .(4.5)

Where:

GDP = Economic growth,

$\mathbf{B_0}$ = Intercept,

$\boldsymbol{\beta_1, \beta_2, \beta_3, \beta_4, \beta_5}$ **and** $\boldsymbol{\beta_6}$ **=** Parameters of variables,

EDU = Government investment spending on Education;

HLTH = Government investment spending on Health;

DEF= Government consumption spending on Defence;

SP = Government consumption spending on Social Protection;

INV = Investment;

INFL = Inflation;

$_t$ = Time (annual),

ε_t = Error term.

4.5. Data description

The analysis study is empirical in nature and therefore the study employed the descriptive and econometric analysis in investigating the impact of disaggregated government investment and consumption spending (education, health, defence and social protection) on economic growth in South Africa. The study used annual time series data for the period 1983–2017. The annual data on GDP, different components of government investment and consumption spending, as well as investment, were sourced from the SARB database. Inflation annual figures were sourced from Statistics South Africa (STATS SA) database. The study used GDP as the dependent variable and as a proxy for economic growth, whereas government investment and consumption spending along with control variables as independent variables: inflation and investment. Investment is used as a proxy for the ratio of gross fixed capital formation (GFCF) to GDP. Dependent and independent variables are calculated in million Rand, except control variables, which are in percentage format, but all the variables were transformed to logarithm form.

4.6. Explanatory notes of the selected variables used in the study

Gross Domestic Product (GDP): Refers to the total value of all final goods and services produced within the boundaries of a country in a particular period (one year). GDP is used as a proxy for economic growth and is expressed in constant 2010 prices.

Defence Spending (DEF): This is government consumption spending which includes government spending on administration, management, and operation of military, civil, foreign military aid and (R&D) defence. Defence is one of the vital government expenditure in several countries because it will increase national security. Spending on defence supports the protection of property rights that will increase the likelihood of receiving the marginal product of capital (Barro, 1991). However, empirical results found the role of defence spending inconclusive. In some cases, defence spending has been found to be absolutely related to economic growth in the long-run (Mosikari and Matlwa, 2014; Maingi, 2017), while others found negative relationship with economic growth (Dunne and Nikolaidou, 1999). The study expects spending on defence to have a negative relationship with growth; therefore, a priori expectation is a negative sign. It is expressed in constant 2010 prices.

Social Protection Spending (SP): This is government consumption spending, which includes expenditure on sickness and disability, old age survivors, unemployment, housing, family and children as well as R&D social protection. Social protection plays a significant role in improving household productivity by promoting investment in the development of human capital and participation in the labour market in developing countries. However, the results from the literature on the relationship between social protection spending and economic growth are inconclusive. Alderman and Yemtsov (2012) provided evidence that showed that increased spending in social protection increases aggregate demand in an economy. On the other hand, Adam and Bevan (2005) found the inverse relationship between the two variables. Thus, social protection spending should have a positive relationship with economic growth. It is expressed in constant 2010 prices.

Education Spending (EDU): This is government investment spending which consists of spending made by the general government on education such as pre-primary, primary, secondary, higher education, and R&D education. Education is used as a proxy for human capital development that affects the labour force. It is another factor that has been discovered to affect economic growth either positively or negatively. Therefore, the relationship between education and economic growth is inconclusive. Most empirical studies such as those by Barro, 1991 and Kabuga and Hussaini, 2015 proved that education contributes to the formation of human capital because an educated population boost economic growth. The NDP has also emphasised human capital as basics for the formation of a more inclusive and equitable country (NDP, 2012). Although education has been emphasised as one of the top three national priorities in South Africa, some studies found an inverse relationship between education spending and economic growth (Abu and Abdullahi, 2010; Easterly and Rebelo, 1993). Thus, a priori expectation is either negative or positive sign. Education spending is expressed in constant 2010 prices.

Health Spending (HLTH): This is government investment spending which includes all spending made by the general government for health services, such as health products and medical devices and equipment, hospital services, public health services, outpatient services, medical equipment and Research and Development (R&D) health. It is used as a proxy for human capital development that affects the labour force. It is another factor that is essential for the growth and development of society. There have been conflicting results in the recent empirical literature regarding the impact of health on economic growth. Some studies found a positive relationship (Maingi, 2017) while others found an inverse relationship (Were, 2001). Thus, health spending is expected to have a positive relationship with growth. It is expressed in constant 2010 prices.

Investment (INV) is a study controlled variable. It is defined as the value of fixed capital assets (plus stock) produced in an economy over the period of time. It is expressed in constant 2010 prices. Thus,

is expected to have a positive and statistically significant impact on economic growth. A priori expectation is a positive sign.

Inflation (INFL) is a study controlled variable: it is defined as a sustained increase in the general price level of goods and services in an economy over a period of time. It is another important macroeconomic variable that determines economic growth. The effects of inflation on economic growth are many and can be at the same time positive and negative (Nell, 2000). Inflation can have three potential impacts on economic growth: a positive impact, a negative impact and no impact at all. Economic theory stated that inflation uncertainty might have a negative impact on economic growth than the inflation rate (Hodge, 2006). The high inflation rate can have a negative impact on growth; however particular inflation magnitudes might have a positive effect on growth. It is expected that the inflation rate negatively affect economic growth. Thus, a priori expectation is a negative relationship between inflation rate and economic growth.

4.7. Methods of analysis

Descriptive statistics will present simple summaries regarding the sample and describe the essential features of the data. The study used actual data of the variables to measure the central tendency, dispersion and normality. These measures are used to describe the quantitative data and statistical methods for data analysis. Regarding the econometric techniques, the study first tests all the variables for stationarity or the presence of unit roots by employing Augmented Dickey-Fuller (ADF) and Philip Perron (PP) approaches.

Furthermore, to empirically analyse the long-run impact of disaggregated government investment and consumption spending on economic growth, the study employed the ARDL cointegration technique developed by Pesaran and Shin, (1999) and Pesaran, Shin and Smith (2001). The ARDL bounds cointegration test technique is used due to its several advantages over other conventional cointegration methods. The ARDL bounds test method is ideal when dealing with variables that are integrated with various orders (I(0), I(1)) or fractionally integrated or integrated with order one I(1) only; the method is strong when there is a single long-run relationship between the underlying variables in a small sample size. It shows whether or not the underlying variables move along in a long-run.

The ARDL bounds cointegration test model used in this study is expressed by transforming equation 4.5 as follows:

$$\Delta In\text{GDP}_t = \varphi_0 + \sum_{i=1}^{p} \varphi_1 \Delta InGDP_{t-i} + \sum_{i=1}^{q} \varphi_2 \Delta InEDU_{t-i} + \sum_{i=0}^{q} \varphi_3 \Delta InHLTH_{t-i} + \sum_{i=0}^{q} \varphi_4 \Delta InDEF_{t-i} + \sum_{i=0}^{q} \varphi_5 \Delta InSP_{t-i} + \sum_{i=0}^{q} \varphi_6 \Delta InINV_{t-i} + \sum_{i=0}^{q} \varphi_7 \Delta InINFL_{t-i} +$$

$\beta_1 InGDP_{t-1} + \beta_2 InEDU_{t-1} + \beta_3 InHLTH_{t-1} + \beta_4 InDEF_{t-1} + \beta_5 InSP_{t-1} + \beta_6 InINV_{t-1} + \beta_7 InINFL_{t-1} + \varepsilon_t$ ..... (4.6)

In equation (4.6), GDP is the dependent variable; EDU, HLTH, DEF, SP, INV and INFL are independent variables. β_1 to β_7 and φ_1 to φ_7 are long-run and short-run elasticities. Δ is a difference operator; p and q are the lag lengths and ε_t is an error term.

Additionally, under the ARDL technique, the null hypothesis of no long-run relationship among the underlying variables can be rejected if the calculated F-statistic is higher than the upper bound of the critical values. Similarly, the null hypothesis cannot be rejected if the calculated F-statistic is lower than the lower bound critical values. If the F-statistic falls between the lower and upper bound, the result is inconclusive. The null and alternative hypotheses are as follows:

$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$ (no long-run relationship)

Against the alternative hypothesis

$H_1 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta 7 \neq 0$ (a long-run relationship exists)

Additionally, the computed F-statistic will be assessed with the critical values. The lower bound critical values assumed that the explanatory variables are integrated with order zero, or I(0), while the upper bound critical values assumed that explanatory variables are integrated with order one, or I(1). Moreover, under this technique, if cointegration is found, both the long-run and the short-run model of equation (4.6) can be estimated using the standard OLS in order to attain the speed of adjustment of economic growth back to the equilibrium as well as the short-run and long-run coefficients.

The ECM is expressed by re-parametering equation 4.6 as follows:

$\Delta In\text{GDPt} = \beta_0 + \sum_{i=1}^{P} \varphi_1 \, \Delta InGDP_{t-i} + \sum_{i=0}^{q} \varphi_2 \, \Delta InEDU_{t-i} + \sum_{i=0}^{q} \varphi_3 \Delta InHLTH_{t-i}$
$+ \sum_{i=0}^{q} \varphi_4 \Delta InDEF_{t-i} + \sum_{i=0}^{q} \varphi_4 \Delta InSP_{t-i} + \sum_{i=0}^{q} \varphi_5 \Delta InINV_{t-i} + \sum_{i=0}^{q} \varphi_5 \Delta InINFL_{t-i} + \gamma \text{ECTt-1} +$
ε_t ..... (4.7)

In equation (4.7), γ is the speed of adjustment parameter, which measures the short-run speed of adjustment towards the long-run equilibrium, and ECT is the error correction term. The statistically significant ECT coefficient must be negative and less than one. The ECT has a lag of one; this indicates the percentage of the speed of adjustment from a shock in the previous period to the current equilibrium period.

4.8. Conclusion

This chapter discussed the research design applied in the study including the theoretical framework and empirical model specification employed. Furthermore, the study described the variables of interest, and methods of analysis applied in the study. The models and variables of interest helped in realising the objectives of this study as outlined in chapter one. Similarly, all the steps involved in the selected methodology were analysed to describe the impact of disaggregated government investment and consumption spending on economic growth in South Africa.

CHAPTER 5.

RESULTS AND INTERPRETATIONS

5.1. Introduction

This chapter presents the estimated results of the equations specified in the previous chapter. The empirical analysis, using the descriptive statistics, unit root test, and ARDL and ECM techniques, is presented and discussed in this chapter.

5.2. Descriptive statistics

Descriptive statistics is used in the study to describe the basic features of the data. The study used actual data of the variables to measure the central tendency, dispersion and normality.

Table 0.1 Descriptive statistics of variables: 1983–2017

Variables	GDP	EDU	HLTH	SP	DEF	INV	INFL	Observation
Mean	2139135	90758	50859	60864	19623	19.29	8.73	35
Median	1954710	53451	25662	29959	12673	19.10	7.10	35
Maximum	3119984	306584	185291	222156	47173	27.90	18.70	35
Minimum	1447310	4348	2394	1511	3477	15.20	1.40	35
Standard Deviation	574726	90520	54936	65749	12825	3.00	4.34	35
Skewness	0.44	1.06	1.16	1.03	0.65	0.86	0.61	35
Kurtosis	1.65	2.86	3.01	2.81	2.19	3.54	2.32	35
Jarque-Bera	3.81	6.62	7.81	6.22	3.45	4.74	2.85	35
Probability	0.15	0.04	0.02	0.05	0.18	0.09	0.24	35

Analysis by author, 2019 using Eviews 10.

Table 5.1 above displays the result of descriptive statistics of each of the variables in the study. During the examined time period, the GDP exhibited the higher mean, median, maximum and minimum values than that of independent variables (EDU (education), HLTH (health), SP (social protection), DEF (defence), INV (investment) and INFL (inflation). This shows that GDP has more extremely large values than others do. Furthermore, investment recorded the lowest standard deviation followed by inflation and defence. The skewness, which measured the symmetrical nature of the data series, revealed that all variables under study are positively skewed. Positive skewness indicates that the size of the right-handed tail is larger than the left-handed tail.

The kurtosis measures the peakness or flatness of the distribution of the data series. A normal distribution has a kurtosis of exactly 3. Health recorded kurtosis value of 3, implying that the data set has a normal distribution. According to Westfall (2014), a higher kurtosis means that more of the variance is the result of uncommon and extreme deviations, as opposed to frequent modestly sized deviations. A distribution with kurtosis of >3 (excess kurtosis >0) is called leptokurtic. Its tails are longer, flatter and often its central peak is higher and sharper. The results further reveal that investment recorded a kurtosis value of more than 3, implying that the data set has a heavier tail than a normal distribution. The GDP, education, health, social protection, and defence recorded kurtosis values of less than 3, indicating that the distribution is shorter and data set has a lighter tail than a normal distribution. According to Westfall (2014), a distribution with kurtosis of <3 (excess kurtosis <0) is called platykurtic. It is less sharply peaked than the normal distribution and its tails are shorter and thinner and often its central peak is lower and broader.

The Jarque-Bera is a goodness-of-fit test which measures the difference between the skewness and kurtosis of the data series with those from a normal distribution. The probability of Jarque-Bera statistics for GDP, defence, investment and inflation variables are above the statistical significance level (0.05); therefore, the null hypothesis cannot be rejected, implying that GDP, defence, investment, and inflation have a normal distribution. Moreover, the probability of Jarque-Bera statistics for education, health and social protection variables are above and equals to the statistical significance level (0.05), which leads to rejection of the null hypothesis of a normal distribution. Therefore, the results confirmed that the skewness and kurtosis of education and health data set do not have a normal distribution, suggesting that the data series is not normally distributed.

5.3. Correlation analysis

The correlation analysis is used in the study to determine the strength and direction of the linear relationship between the dependent and independent variables. The correlation coefficient ranges from -1 to 1. A value of 1 indicates that a linear equation suggests the correlation between the variables perfectly, with all data points lying on a line for which the dependent variable increases as independent variables increases. A value of -1 suggests that data points fall on a line for which the dependent variable decreases as independent variables decreases. The value of 0 suggests that there is no linear relationship between the variables. The results are presented in Table 5.2.

Table 0.2 Correlation results

Correlation	LGDP	LEDU	LDEF	LINV	LHLTH	LINFL	LSP
LGDP	1.00						

LEDU	0.95	1.00					
	(17.58)***	-----					
LDEF	0.95	0.98	1.00				
	(17.95)***	(28.19)***	-----				
LINV	-0.06	-0.34	-0.27	1.00			
	(-0.37)	(-2.05)	(-1.63)	-----			
LHLTH	0.97	1.00	0.98	-0.28	1.00		
	(22.03)***	(82.26)***	(28.86)***	(-1.67)	-----		
LINFL	-0.65	-0.71	-0.65	0.45	-0.70	1.00	
	(-4.91)	(-5.81)	(-4.94)	(2.89)	(-5.58)	-----	
LSP	0.95	1.00	0.97	-0.34	0.99	-0.73	1.00
	(17.64)***	(64.75)***	(24.60)***	(-2.05)	(51.01)***	(-6.21)	-----

Analysis by author, 2019 using Eviews 10. T-statistics are inside the brackets ( ).

The findings from the correlation matrix show that all the variables highly correlate with each other. Government expenditure on LEDU (education), LDEF (defence) and LSP (social protection) has a very strong positive correlation of 0.95 with LGDP (GDP). Thus, when the South African government increases expenditure on education, defence and social protection, the GDP also increases. On the other hand, government expenditure on health recorded a very strong positive correlation of 0.97 with GDP. This indicates that a unit increase in economic growth is attributed to a 0.97 increase in government expenditure on health. There is adequate evidence to conclude that the strength of the relationship between the dependent variable (GDP) and government expenditure (health, education, defence, social protection) is very high, implying that there is a significant linear relationship between the variables. These findings are in agreement with the findings of Thaddeus and Nneka (2012) who studied the impact of government sectorial expenditure on the economic growth of Nigeria; their findings suggest that public spending on health, education and defence correlates with economic growth. These results, however, are in conflict with the work of Butkiewicz and Yanikkaya (2008) who found an insignificant positive correlation between public spending on education, defence, and health expenditure and economic growth in developing nations. Moreover, the correlation coefficient between GDP and control variables (investment and inflation) show a negative relationship. This indicates that there is no significant linear relationship between the variables.

5.4. Unit root test results

In order to examine the stationary levels of variables, the study employed Augmented Dickey-Fuller (ADF) (Dickey and Fuller 1979, 1981) and Phillips–Perron (PP) tests (Phillips Perron, 1989, 1997). The choice of the optimal model is based on the Akaike Information Criteria (AIC) and the selected lag length of (p, q_1, q_2, q_3, q_4, q_5, q_6). The results of ADF and PP unit root tests at levels and at their first differences are summarised in Tables 5.3 and 5.4, respectively.

Table 0.3 ADF test results

Variables	Model	At Level		1st Difference	
		T-Statistics	Order of integration	T-Statistics	Order of integration
LGDP	Trend & Intercept	-2.887945	Not Stationary	-3.754934**	Stationary I(1)
LEDU	Trend & Intercept	-1.98633	Not Stationary	-4.324957***	Stationary I(1)
LDEF	Trend & Intercept	-2.421045	Not Stationary	-5.109118***	Stationary I(1)
LINV	Trend & Intercept	-2.549179	Not Stationary	-3.799379**	Stationary I(1)
LHLTH	Trend & Intercept	-2.065615	Not Stationary	-4.809703***	Stationary I(1)
LINFL	Trend & Intercept	-3.183337	Not Stationary	-5.661011***	Stationary I(1)

Table 0.4 PP test results

Variables	Model	At Level		1st Difference	
		T-Statistics	Order of integration	T-Statistics	Order of integration
LGDP	Trend & Intercept	-1.59238	Not Stationary	-3.760783**	Stationary I(1)
LEDU	Trend & Intercept	-1.98633	Not Stationary	-4.324957***	Stationary I(1)
LDEF	Trend & Intercept	-2.45358	Not Stationary	-5.148105***	Stationary I(1)
LINV	Trend & Intercept	-2.44360	Not Stationary	-3.45761*	Stationary I(1)
LHLTH	Trend & Intercept	-2.10131	Not Stationary	-4.784499***	Stationary I(1)
LINFL	Trend & Intercept	-3.023955	Not Stationary	-11.84880***	Stationary I(1)

*Analysis by author, 2019 using Eviews 10. Notes: Selection of lags based on Akaike information criterion; ***, **, * indicates the rejection of the null hypothesis of non-stationarity at 1% =-4.26, 5%=-3.55 and 10%=-3.21 level of significance, respectively.*

The ADF and PP unit root tests for the log transform of the data show strong evidence that the variables are non-stationary at their levels but become stationary after first differencing. This means the series is integrated with order one, I(1). The results of the study show that the null hypothesis that states that the variables under consideration have unit root is rejected at all levels of significance. The study results are in favour of the alternative hypothesis of no unit root.

5.5. ARDL bounds test for cointegration

To examine the existence of a long-run relationship among the variables since they are all integrated with order one, I(1), the ARDL bounds test technique for cointegration endorsed by Pesaran, Smith and Shin (2001) is used. The ARDL bounds test to cointegration technique is used owing to its advantages over other conventional cointegration methods. This technique is ideal when dealing with variables that are integrated with a different order, I(0), I(1) or fractionally integrated or integrated with the order one I(1) only. The technique is robust when there is a single long-run relationship between the underlying variables in a small sample size. Furthermore, both the short-run and long-run relationships can be estimated simultaneously.

Under this technique, the F-statistics is used to determine whether there is cointegration among the underlying variables. The null hypothesis of no long-run relationship among the underlying variables can be rejected if the calculated F-statistic is higher than the upper bound of the critical values. Similarly, the null hypothesis cannot be rejected if the calculated F-statistic is lower than the critical values. If the F-statistics falls between the lower and upper bound, the test is considered inconclusive. The null and alternative hypotheses are as follows:

$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$ (no long-run relationship)

Against the alternative hypothesis:

$H_1 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0$ (a long-run relationship exists)

Moreover, the computed F-statistic is assessed with the critical values for different numbers of variables (k). The computed F-statistics will produce two sets of critical values; that is the lower bound critical values which presumed that the explanatory variables are integrated with order zero, or I(0), meaning that there is no cointegration among the underlying variables. The upper bound critical values presumed that explanatory variables are integrated with order one, or I(1), meaning that there is cointegration among the underlying variables. The study selected a maximum lag order of 3 for the conditional ARDL by using the AIC. The computed F-statistics are reported in Table 5.5.

Table 0.5 ARDL Bounds test for cointegration results

Specification	Model	F-Statistics	Critical Value Bounds			Cointegration Status
			Significant	Lower Bound	Upper Bound	
LGDP= *f* {LEDU, LDEF, LINV, LHLTH, LINFL, LSP}	**Critical Values for K= 6**					
	(3, 3, 3, 2, 2, 3, 2)	8.54***	1%	2.88	3.99	Cointegration
			2.5%	2.55	3.61	
			5%	2.27	3.28	
			10%	1.99	2.94	

Analysis by author, 2019 using Eviews 10. Null Hypothesis: No long-run relationships exist. Note: *** 1% significance level; ** 5% significance level; * 10% significance level. K is the number of explanatory variables.

Table 5.5 shows the ARDL bounds test for cointegration results. The Akaike information criterion (AIC) was applied to define the most suitable lag length for the estimated ARDL equation. The optimal lag length was selected based on the number of regressions included in the model, which is ARDL (3, 3, 3, 2, 2, 3, 2) with an adjusted R^2 of 0.99. The results further show the computed F-statistics of 8.54, which is significant at the 1 percent upper critical bound. Thus, the study infers that a long-run cointegration amongst the underlying variables does exist. Therefore, the null hypothesis is rejected. These results are in line with the studies carried out by Khosravi and Karimi (2010) in Iran for the period 1960–2006 and the study carried out by Anning, Haisu and Ritito, (2017) in Ghana over the period 1980–2015; they both applied ARDL bounds test for cointegration and found that long-run relationship exists between government expenditure and economic growth. Because the study found cointegration among the variables, the short-run and long-run coefficient will be assessed using the standard OLS.

5.6. Long-run and short-run results

An ECM helps to study the presence of equilibrium or disequilibrium between short-run dynamic adjustments and long-run equilibrium. The results of long-run coefficients and short-run dynamic adjustments are showed in Panel A and Panel B of Table 5.6 respectively.

Table 0.6 Estimated long-run and short-run coefficients results

Panel A: Long Run Coefficients				
Dependent variable: GDP				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
LOG_EDU	-0.395***	0.119	-3.313	0.013
LOG_DEF	0.005	0.030	0.152	0.883
LOG_INV	0.331***	0.081	4.076	0.005
LOG_HLTH	0.397***	0.115	3.446	0.010
LOG_INFL	-0.111***	0.019	-5.774	0.001
LOG_SP	0.139***	0.034	4.062	0.005
C	12.600***	0.375	33.602	0.000
Panel B: Short Run Coefficients				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(LOG_GDP(-1))	-0.381	0.129	-2.954	0.021
D(LOG_GDP(-2))	-0.260	0.132	-1.971	0.089
D(LOG_EDU)	-0.015	0.031	-0.472	0.652
D(LOG_EDU(-1))	-0.001	0.035	-0.040	0.970
D(LOG_EDU(-2))	0.077	0.028	2.771	0.028
D(LOG_DEF)	0.098	0.014	7.149	0.001
D(LOG_DEF(-1))	0.110	0.016	7.005	0.001
D(LOG_DEF(-2))	0.032	0.014	2.323	0.053
D(LOG_INV)	0.322	0.030	10.718	0.001
D(LOG_INV(-1))	-0.079	0.026	-3.001	0.020
D(LOG_HLTH)	0.079	0.033	2.376	0.049
D(LOG_HLTH(-1))	-0.089	0.034	-2.656	0.033
D(LOG_INFL)	-0.020	0.003	-7.550	0.001
D(LOG_INFL(-1))	0.028	0.005	5.963	0.001
D(LOG_INFL(-2))	0.027	0.003	8.566	0.001
D(LOG_SP)	0.044	0.009	4.654	0.002
D(LOG_SP(-1))	-0.061	0.009	-6.925	0.001
Ect(-1)	-0.727	0.062	-11.688	0.001

**** Significant at 0.01 ** significant at 0.05 * significant at 0.1*

The long-run coefficient (Panel A) shows that the coefficient of government investment expenditure on education has a significant negative effect on economic growth at the 1 percent significance level in the long- run. This implies that a 1 percent increase in education reduces economic growth by 0.40 percent in the long- run. Despite the substantial share of government spending devoted to education, education has not enhanced the South African economy in the long-run. This is due to the failure of the education system that has had an extreme impact on the South African economy and the high rate of unemployment. The country's substandard education system also results in an imbalance in the returns on skills, low labour productivity, and low labour income in the self-employed informal sector (FFC, 2018). These negative results are consistent with an empirical study conducted by Kouton (2018) in Côte d'Ivoire over the period 1970–2015. The study applied the ARDL bounds test technique and found government education expenditure to have a negative growth effect in the long-run. Another study that found a long-run negative growth effect of government expenditure education was conducted in Barbados over the period 1976–2011. The study employed the unrestricted ECM to analyse time series data (Carter, Craigwell and Lowe, 2013).

Furthermore, the short-run (Panel B) results show a negative insignificant impact of government education expenditure at the current year and at the first lag. On the other hand, the study reveal a significant positive growth effect of government education expenditure at the second lag at a 5 percent significance level in the short-run. A priori expectation of education expenditure is either negative or positive based on the threshold impact; the positive impact of government investment expenditure on growth shows that government investment expenditure on education only enhances economic growth in the short-run. Thus, this confirms the hypothesis that government investment expenditure on education is positively associated with economic growth in the short-run and negatively associated with the South African economy in the long-run. In South Africa, education has been emphasised as one of the top three national priorities and it is well resourced with a substantial share of government spending devoted to education. Since 1994, the country has directed more funds into social programs and services with the aim of reducing poverty. These include policies of no fee-paying schools and the provision of free basic services (National Treasury, 2010–2017).

The study results could not find any significant impact of government consumption expenditure on defence and economic growth in the long-run. However, in the short-run, government consumption expenditure on defence at the current, first and at second lags was found to have significant and positive growth effect at 1 percent and 5 percent significance level. At 5 percent significance level, defence at second lag was also found to be positively and significantly associated with economic growth. This is due to the fact that the South African government channelled resources to the defence sector for internal and external security threats. If defence is regarded as an integral public service, then conventional

public finance theory suggests that the levels of military spending should be positively related to income (Dunne and Nikolaidou, 2000). The neoclassical growth model found a positive impact of defence on economic growth while Keynesian found a negative impact. Therefore, the results do not carry a significant negative sign.

Furthermore, the empirical results reveal a positive and significant impact between government investment spending on health and economic growth in the long-run at a 1 percent significance level. This outcome suggests that a 1 percent increase in health expenditure leads to a 0.40 percent increase in economic growth in the long-run. The possible reason for the positive effect of health expenditure on economic growth is that the economic well-being of every population results in higher labour force productivity, thus an increase in economic growth. This implies there is a positive relationship between government health expenditure and economic growth in the long-run enabled by efficient allocation of resources. When the labour force is healthy, they tend to develop new knowledge and skills more because they expect to enjoy long-term benefits (Bloom and Canning 2004). On the contrary, if the labour force is characterised by workers with poor health, productivity declines; this explains the development inconsistency in different regions of the world. In South Africa, the health sector is prioritised budget-wise; the bulk of expenditure is devoted to the health sector and it grows consistently. This sector is guided by a very strong policy framework with determined goals and donor funding has continued to make strong contributions. South Africa is among the highest investors in health on the continent (United Nations Children's Fund (UNICEF), 2018).

The positive effect of government health expenditure on economic growth is supported by the regression results of an empirical study conducted by Oluwatoyin and Fagbeminiyi (2010) in Nigeria. On the other hand, the current health expenditure shows a positive growth effect in the short-run at a 5 percent significance level. The short-run results further show a negative growth effect of the first lag of health expenditure at a 5 percent significance level. According to Schellack et.al (2011), the South African government had a high health expenditure and a number of policies coupled with persistently poor health outcomes than those in many lower-income countries. The study conducted by Idenyi et al. (2016) believed that the success of the broad-based health targets is influenced by the realisation of broad economic goals. Based on these results, the study encourages countries to invest more funds into the health sector. For the most developing economies, however, the study claims investing more in the health sector has not translated into improved health status; this could be due to poor governance. The results support the initial expectations of a positive sign.

The empirical results also reveal that the impact of government consumption expenditure on social protection at the current year was positively linked with the economic growth at a 1 percent significance level in the short-run. The short-run results further show a negative effect of the first lag of social

protection on growth at a 1 percent significance level. In the long-run, government consumption expenditure on social protection was found to have a positive impact on growth at a 1 percent significance level. This implies that a 1 percent increase in government consumption expenditure on social protection leads to a 0.14 percent increase in growth in the long-run. The positive growth effect was also found by Chirwa and Odhiambo (2016) for South Africa. Thus, on average, government consumption expenditure on social protection has been positively linked with growth in the short-run at a 1 percent significance level. Government consumption expenditure on social protection does carry the expected positive sign. This confirms the hypothesis that social protection expenditure has a significant positive impact on economic growth in South Africa.

The control variable (investment) was found to have a positive and significant impact on growth in both the short-run and long-run. This implies that a 1 percent increase in investment will lead to an increase in economic growth by 0.33 percent in the long-run, respectively. However, the short-run results reveal that investment at first lag has a negative and significant effect on growth. Therefore, the investment carries an expected positive sign. In addition, the control variable (inflation) at the current year was found to have a significant and negative growth effect at a 1 percent significance level in the short-run and long-run. This implies that a 1 percent increase in the inflation at the current leads to 0.11 percent deterioration in economic growth in the long-run. Hodge (2006) investigated the association between inflation and growth in South Africa over the period 1950–2002 and found a significant negative association between the two variables over the medium to long-term. In contrast, inflation at first and second lag was found to have a significant positive impact on economic growth in the short-run. The positive impact of inflation on Nigerian growth was also found by Umaru and Zubairu (2012). Overall, inflation carries an expected negative sign.

The results for short-run dynamic adjustment, reported in Table 5.6 Panel B, show a negative error correction coefficient and statistical significance at a 1 percent significance level. The ECM value lies in the range of 0 to -1, which indicates a convergence of the variables towards equilibrium. The significant error correction term (ECT) confirms that all the variables under study are cointegrated or have a long-run relationship. It also implies a low speed of adjustment to equilibrium and that the speed of adjustment towards long-run equilibrium is 73 percent annually. Therefore, the system corrects its disequilibrium in the previous years at the speed of 73 percent annually. That is, about 73 percent of the last year's disequilibrium is corrected in the current year, suggesting a good speed of adjustment. A highly significant ECT indicates a stable long-term relationship (Banerjee, Dolado and Mestre, 1998). In addition, both R^2 and adjusted R^2 are greater than 50 percent, which is evident that independent variables explain the variance in the dependent variable.

Government expenditure on education, health, defence and social protection add 73 percent per year to South African economic growth for equilibrium to be reinstated in the long-run. The variables under study are statistically significant and therefore explain the changes in economic growth. This result is supported by the R^2 of 0.97, indicating that 97 percent variation is explained by the other variables not considered in the ECT model. The F-statistics determined the overall or joint influence of independent variables on dependent variables (the F-test of 8.54) this indicates that the independent variable has a joint impact on disaggregated government investment and consumption spending on economic growth in South Africa. Hence from above, we could conclude that in South Africa, data supports the Keynesian's law wherein government spending increases economic growth.

5.7. Diagnostic test

This phase is critical in the analysis of the impact of disaggregated government investment and consumption spending on economic growth in South Africa. Different tests were conducted to test if the regression model follows the linear regression model properties. Serial correlation was tested using Lagrange Multiplier (LM). While, heteroscedasticity test was conducted using Autoregressive conditional heteroscedasticity test (ARCH test), and normality assumption using Jarque-Bera test statistic. These tests are based on the null hypothesis that there is no serial correlation for the LM test; there is no normality for the Jarque-Bera test and there is no heteroskedasticity. Stability test using cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ). The results of a diagnostic test that examine the adequacy of the model are presented in Table 5.7.

Table 0.7 Diagnostic test results

Test	Null Hypothesis	LM Version	F Version/[Prob.]
Normality: Jarque-Bera	Normally distributed residuals	Not applicable	0.048 [0.976]
Heteroskedasticity: ARCH	Homoskedasticity	X2 (3) = 0.489 [0.921]	F(3,25) = 0.143 [0.933]
Serial Correlation: Breusch-Godfrey LM	No serial correlation	X2 (1)= 1.660 [0.198]	F(1,6) = 0.588 [0.328]

The results indicate that the null hypothesis cannot be rejected because the p-values are greater than a 5% significance level. Thus, the model passed the diagnostic tests against serial correlation and heteroscedasticity. Table 5.7 shows that the residuals from the regression are normally distributed (see Table 5.7).

5.8. Stability test

The stability tests are used in a study to check stability within the model and to test whether or not the model displays structural changes. The tests include the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ). The results are presented in figure 5.1 and figure 5.2, respectively.

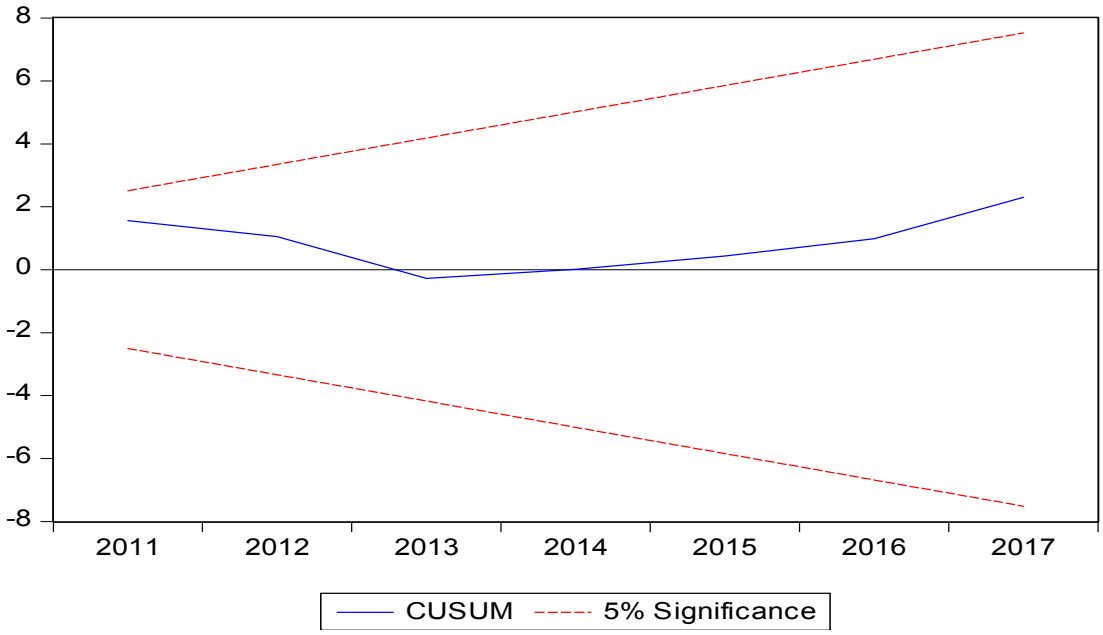

Figure 0:1 Plot of CUSUM test

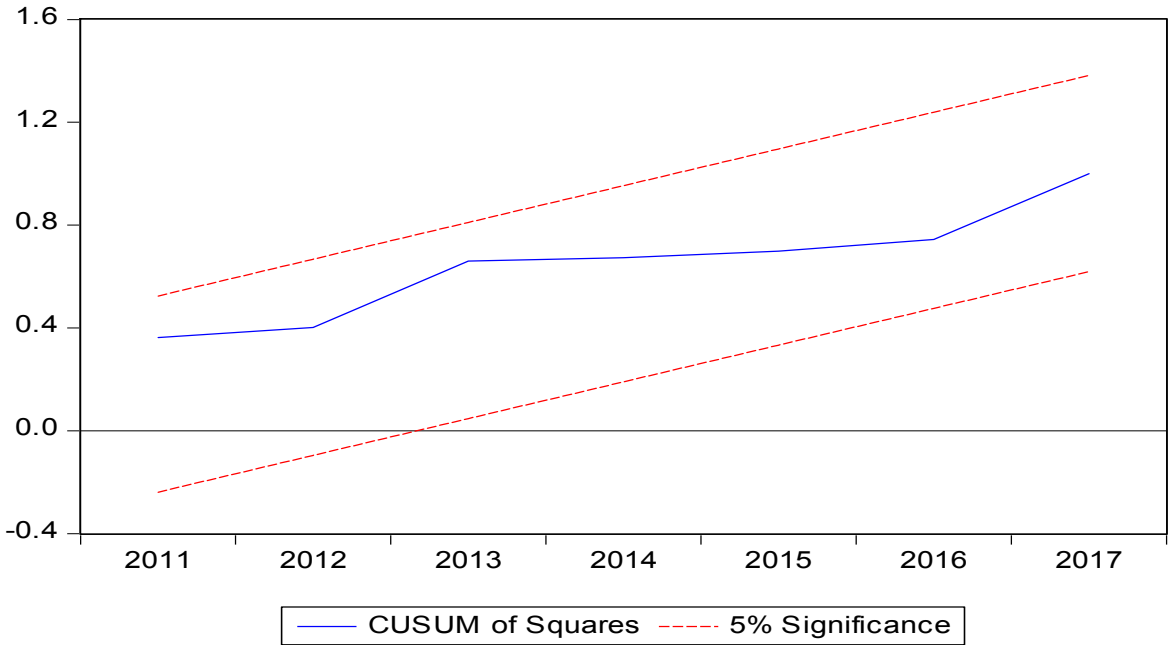

Figure 0:2 Plot of CUSUMSQ test

The results of stability tests show that the coefficients in the model are stable as reflected by the blue lines found within two-red dotted lines (critical lines) in figures 5.1 and 5.2. The straight line signifies critical bounds at a 5 percent significance level. The CUSUM and CUSUMSQ tests result lie within the 5 percent boundary, which confirms a good performance of the model.

5.9. Conclusion

The study aimed to examine the impact of disaggregated government and consumption spending on economic growth in South Africa. It contributed to research by empirically measuring the impact of further disaggregated components of government investment and consumption spending on economic growth in South Africa. The results confirm a strong and significant positive correlation between dependent and independent variables. Thus, when the government increases expenditure on education, health, defence, and social protection, the GDP also increases. Moreover, the results from the ARDL bounds test for cointegration analysis found evidence supporting a long-run relationship among variables. These findings are in line with the Keynesian's theory, which states that government spending has a positive effect on the national income. The diagnostic tests, such as normality, heteroscedasticity, and stability, were employed to ensure the accuracy of attained results. The graphical evidence (CUSUM and CUSUMQ) indicates that the model is stable.

CHAPTER 6.

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

6.1. Introduction

This chapter provides a summary of the findings, conclusions, and possible policy recommendations based on the data analysed in the previous chapter. It also highlights the delimitations of the study and suggests areas for further research.

6.2. Summary of the findings

Although more literature on the impact of government expenditure on economic growth exists, there is no consensus on the relationship between government expenditure and economic growth. Therefore, arguments on whether government expenditure benefits or hinders economic growth may continue. In support of the notion of a relationship between government expenditure and economic growth, empirical studies on developed and developing countries present either a positive significant or positive insignificant, negative significant or negative insignificant impact of government expenditure on economic growth in the countries.

The first objective of the study was to empirically examine the impact of each component of the disaggregated government investment and consumption spending (health, education, defence, social protection along with control variables (investment and inflation) and economic growth) in South Africa. The second objective was to empirically examine the short-run and long-run relationship between disaggregated government investment and consumption spending on economic growth.
The third objective was to test the applicability of Keynes theory, thereby determining whether there is a positive correlation between disaggregated government investment spending and consumption on economic growth and economic growth.

The annual data covering the period 1983–2017 on GDP, government investment and consumption spending as well as an investment were sourced from the SARB database. Inflation figures were sourced from the Stats SA database. The study used GDP as the dependent variable and government investment and consumption spending along with control variables as independent variables. This study applied time series techniques such as the stationarity test (ADF and PP), ARD technique, ECM technique, diagnostic and stability tests to attain its objectives. ARDL technique proved a long-run relationship between the variables whilst the ECM provided parameter estimates for both the long-run and the error correction.

In examining the impact of government investment expenditure on education on economic growth, the result revealed a long-run negative relationship between the two variables. These negative results are consistent with an empirical study conducted by Kouton (2018) in Côte d'Ivoire over the period 1970–2015. The study applied the ARDL bounds test technique and found a negative relationship between education and economic growth in the long-run in Côte d'Ivoire. Despite the substantial share of government spending devoted to education, education has still failed to enhance the South African economy in the long-run. It is evident that government investment spending on education at second lag has a positive significant impact on economy only in the short-run.

The study could not find any significant impact between government consumption expenditure on defence and economic growth in the long-run. However, in the short-run, government consumption expenditure on defence at the current, first and second lags was found to have significant and positive growth effect. Furthermore, the empirical results revealed that a positive and statistically significant impact was found between government investment expenditure on health and economic growth in the long-run. This implies that government investment expenditure on health enhances economic growth in the long-run through the efficient distribution of resources. Bloom and Canning (2004) claimed that when the labour force is healthy, their incentive to develop new knowledge and skills is higher because they expect to enjoy long-term benefits. In the short-run, government investment expenditure on health was significant and positive, while at first lag was found to have significant and negative growth effect.

Moreover, the empirical results revealed that government consumption expenditure on social protection has significant and positive growth effect in the long-run. The short-run results revealed that social protection at the current has significant positive effect on economic growth and social protection at first lag was found to have significant negative effect on economic growth. The control variable (investment) is positively and statistically associated with economic growth in the short-run and long-run. In addition, inflation at the current year was found to have a detrimental effect on growth in the short-run. However, inflation at first and second lag shows a positive and statistically significant link with economic growth in the short-run.

Error correction results indicated a convergence towards steadiness in the long-run with the adjustment of 73 percent per annum. The significant ECT confirms that all the variables under study are cointegrated or have a long-run relationship. It also implies a low speed of adjustment to equilibrium and that the speed of adjustment towards long-run equilibrium is 73 percent annually. Therefore, the system corrects its previous year's disequilibrium at the speed of 73 percent annually. That is, about 73 percent of the last year's disequilibrium is corrected in the current year, suggesting a good speed of adjustment. In addition, both R^2 and adjusted R^2 are greater than 50 percent, which is evident that the variance in the dependent variable is explained by the independent variables. We could therefore

conclude that, in South Africa, data supports the Keynesian's theory wherein government spending increases economic growth.

6.3. Policy recommendations

Based on the findings attained from the previous chapter, the following recommendations are presented to help government attain a desired growth in South Africa:

The results revealed a long-run negative relationship between government investment spending on education and economic growth. Despite the substantial share of government spending devoted to education, education failed to boost economic growth in South Africa. Thus, the government should pay more focus on how effective that investment is being used. Moreover, the government should invest more in development-effective educational strategy as well as maintain and enhance the quality of education to improve output. There is credible evidence that educational quality has a strong influence on individual earnings and economic growth (Hanushek, and Wößmann, 2007). Policies should focus on quality education as well as the quality of teachers as they are both fundamental ingredients to student performance. For this reason, it is important to implement an education program for experimentation and evaluation. Furthermore, education policy must be viewed as developmental, where continuing evaluation permits discarding policies that are unproductive while increasing those that are productive.

The study could not find any significant relationship between government consumption expenditure on defence and economic growth in the long-run. It is significant for the government to continue investing in health function but direct more resources on promoting health quality and improving efficiency in the administration of the health system. In addition, the government should accelerate and implement its work programme on NHI. It should protect and prioritise programmes and services that are beneficial to children. Furthermore, it should increase its investment in programmes that effectively improve child mortality rates.

Evidence from this study results showed that government consumption spending on social protection increases the growth performance of the country. The government spends a large amount on social protection to address poverty, low economic growth and development as well as vulnerability. Therefore, it should direct more resources only on social protection that maximise productivity. Furthermore, the study recommends that resources should be directed to social protection that can bring other economic reforms that can positively contribute to economic growth and development.

Regarding the government consumption spending on defence, the allocation of resources to the defence function should be reduced further as spending on defence does not contribute to the nation's productivity. This statement is supported by Mitchell (2005); the study recommended a reduction of government spending on projects or programmes that produce minimal gain to citizens or those which urge for higher costs.

The study established that government investment has made growth effect in South Africa. Therefore, the study recommends that the government should increase investment rates, improve the productivity of new and existing investments and ensure that investment is directed towards strategic and priority sectors considered critical for economic transformation. Strengthening the private-sector investment, improving the planning and implementation of infrastructure projects and rebuilding state institutions is urgently obligatory. Therefore, the policy makers should provide an appropriate environment conducive to oversee government spending on gross capital formation as well as private investment spending. In dealing with the economic challenges faced by the South Africa, the study concludes by recommending a prompt focus on socio-economic policies that will increase economic growth and development in line with radical economic transformation. Additionally, the government should implement radical economic transformation in a way that does not compromise the long-term ability of economy to compete in global product and labour markets.

6.4. Recommendations for future research

In the light of the above results, it is recommended that future research studies on this subject engage in a comparative analysis of further disaggregated government investment and consumption spending in South Africa.

6.5. Conclusions

In this study, an attempt was made to examine the impact of government investment and consumption spending on economic growth in South Africa over the period 1983–2017. The relationship between government spending and economic growth is one of the most controversial and intense subjects of analysis in economic literature. This study makes several contributions to the existing body of knowledge on government investment and consumption spending on economic growth. To carry out this study, the researcher first began with an introduction that covered the study background, problem statement, the importance of the study, research objectives, questions and hypotheses, scope and limitation of the study as well as the structure of the study.

Secondly, the study contributed to the research effort at the empirical measure of the impact of disaggregated government and consumption spending on economic growth in South Africa. The theoretical review explored the fundamental arguments between the two schools of thought, namely Wagner's law and Keynesian theory, which are centered on the relationship between government spending and economic growth. The study examined whether government spending is a consequence of economic growth or vice versa. Wagner's point of view was that government spending is the endogenous factor not a cause of economic growth; this means that causality flows from economic growth to government spending. Keynesian theory, on the other hand, noted that government spending

is an exogenous policy instrument that can be used to boost economic growth hence causality flows from government spending to economic growth.

Thirdly, the methodology employed in the study is extensive and secondary data were used for a robust analysis. Fourthly, the results of the study confirm a strong significant positive correlation between dependent and independent variables. Thus, when the South African government increases expenditure on education, health, defence, and social protection, the GDP also increases. Moreover, the results from the ARDL bounds test for cointegration analysis found evidence supporting a long-run relationship among variables. South Africa growth is based on government expenditure as an important economic factor. Therefore, these findings were found to be in line with Keynesian's theory regarding the role of government expenditure as an exogenous factor of economic growth and also found that government spending has an effect on the national income. Moreover, the results are comparable with the results in similar studies that were conducted globally.

Fifthly, the study exposes some areas that need further attention by researchers and policy makers. Lastly, the result of the study will enable the spheres of government to formulate and adjust economic development policies that will produce the needed economic growth in line with the radical economic transformation programme in South Africa.

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APPENDICES

UNIT ROOT TEST
Augmented Dickey Fuller (ADF) Tests for Stationarity

LGDP

Null Hypothesis: LGDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.887945	0.1790
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.
Not stationary in levels

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.754934	0.0323
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.
Stationary in first difference at 5% level (**)

LHEALTH

Null Hypothesis: LHEALTH has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.065615	0.5457
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Not stationary in levels

Null Hypothesis: D(LHEALTH) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.809703	0.0026
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.
Stationary in first difference at 1% level (***)

LEDUCATION

Null Hypothesis: LEDUCATION has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.986330	0.5877
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.
Not stationary in levels

Null Hypothesis: D(LEDUCATION) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.324957	0.0086
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.
Stationary in first difference at 1% level (***)

LDEFENCE

Null Hypothesis: LDEFENCE has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.421045	0.3629

Test critical values:	1% level	-4.252879
	5% level	-3.548490
	10% level	-3.207094

*MacKinnon (1996) one-sided p-values.
Not stationary in levels

Null Hypothesis: D(LDEFENCE) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.109118	0.0012
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.
Stationary in first difference at 1% level (***)

PHILIPS PERRON TESTS

LGDP

Null Hypothesis: LGDP has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.592383	0.7750
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.
Not stationary in levels

D (LGDP)

Null Hypothesis: D(LGDP) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 4 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.760783	0.0319
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Stationary in first difference at 5% level (**)

LHEALTH

Null Hypothesis: LHEALTH has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.101306	0.5267
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Not stationary in levels

D (LHEALTH)

Null Hypothesis: D(LHEALTH) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.784499	0.0027
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Stationary in first difference at 1% level (***)

LEDUCATION

Null Hypothesis: LEDUCATION has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.986330	0.5877
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.

Not stationary in levels

D (LEDUCATION)

Null Hypothesis: D(LEDUCATION) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.324957	0.0086
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Stationary in first difference at 1% level (***)

LDEFENCE

Null Hypothesis: LDEFENCE has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 1 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.453579	0.3475
Test critical values:	1% level	-4.252879	
	5% level	-3.548490	
	10% level	-3.207094	

*MacKinnon (1996) one-sided p-values.
Not stationary in levels

Null Hypothesis: D(LDEFENCE) has a unit root
Exogenous: Constant, Linear Trend
Bandwidth: 2 (Newey-West automatic) using Bartlett kernel

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.148105	0.0011
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

*MacKinnon (1996) one-sided p-values.

Stationary in first difference at 1% level (***)

ARDL ERROR CORRECTION REGRESSION

Dependent Variable: D(LOG_GDP)
Selected Model: ARDL(3, 3, 3, 2, 2, 3, 2)
Sample: 1983 2017
Included observations: 32

ECM Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_GDP(-1))	-0.380525	0.128827	-2.953761	0.0213
D(LOG_GDP(-2))	-0.260267	0.132016	-1.971484	0.0893
D(LOG_EDU)	-0.014826	0.031437	-0.471620	0.6515
D(LOG_EDU(-1))	-0.001423	0.035387	-0.040211	0.9690
D(LOG_EDU(-2))	0.077213	0.027870	2.770505	0.0277
D(LOG_DEF)	0.098373	0.013760	7.149317	0.0002
D(LOG_DEF(-1))	0.110168	0.015728	7.004522	0.0002
D(LOG_DEF(-2))	0.032093	0.013817	2.322707	0.0532
D(LOG_GFCF_R)	0.322459	0.030085	10.71817	0.0000
D(LOG_GFCF_R(-1))	-0.079216	0.026398	-3.000879	0.0199
D(LOG_HLTH)	0.079281	0.033374	2.375512	0.0492
D(LOG_HLTH(-1))	-0.089337	0.033630	-2.656459	0.0326
D(LOG_INFL)	-0.019891	0.002635	-7.549619	0.0001
D(LOG_INFL(-1))	0.027875	0.004675	5.963179	0.0006
D(LOG_INFL(-2))	0.027034	0.003156	8.565679	0.0001
D(LOG_SP)	0.044062	0.009466	4.654581	0.0023
D(LOG_SP(-1))	-0.061408	0.008868	-6.924919	0.0002
CointEq(-1)*	-0.726565	0.062162	-11.68828	0.0000

R-squared	0.972905	Mean dependent var	0.022831
Adjusted R-squared	0.940004	S.D. dependent var	0.019274
S.E. of regression	0.004721	Akaike info criterion	-7.575273
Sum squared resid	0.000312	Schwarz criterion	-6.750797
Log likelihood	139.2044	Hannan-Quinn criter.	-7.301983
Durbin-Watson stat	2.156194		

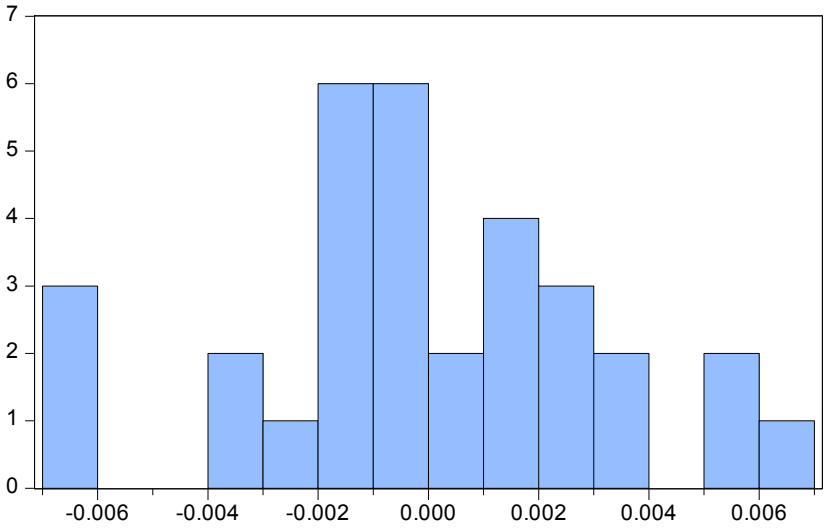
* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	8.538500	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

DIAGNOSTIC TEST

Normality test



Series: Residuals	
Sample 1986 2017	
Observations 32	
Mean	-7.16e-15
Median	-0.000274
Maximum	0.006727
Minimum	-0.006838
Std. Dev.	0.003173
Skewness	-0.065555
Kurtosis	3.136327
Jarque-Bera	0.047700
Probability	0.976432

Heteroskedasticity Test: ARCH

F-statistic	0.142780	Prob. F(3,25)	0.9333
Obs*R-squared	0.488506	Prob. Chi-Square(3)	0.9214

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.328330	Prob. F(1,6)	0.5875
Obs*R-squared	1.660242	Prob. Chi-Square(1)	0.1976